

DP 'Sees' Stars 100 Light-Years Away

By Jim Bartimo
CW Staff

SANTA CRUZ, Calif. — Astronomers here are producing computer-generated images of stars that are roughly 100 light-years away — a feat comparable to seeing Lincoln's ear on a penny from 3,000 miles away.

The problems of merely seeing a star so distant that its light takes 100 years to reach us are obvious. But Dr. Steve Vogt, assistant professor/assistant astronomer at the University of California's Lick Observatory, has reconstructed an image of the star's surface and the spots occurring there. "It's not a picture," Vogt said. "It's a derived image of the star."

To create these images, Vogt starts with a rough estimate of the star's surface appearance. The estimate is taken from other astronomical data such as X-



This computer-generated graphic is a preliminary derived image of UX Arise, a spotted RS CVn binary star. The line below the graphic is a synthetic absorption line profile, a method of spectral analysis from which the image is derived.

ray analysis. The data is fed into a Digital Equipment Corp. VAX-11/780 supermini; the supermini matches the estimate with more exact methods of spectral analysis and plots the image on a DEC VT100 high-resolution graphics printer.

The matching process is repeated until an accurate representation of the star is complete. "You have to divide the star up into tens of thousands of parts — each with its own spectral characteristics," Vogt said.

The stars that Vogt is studying in an effort to understand sunspots and other solar activity better — RS CVn stars — are all part of binary systems. In other words, they are pairs of stars that revolve around each other in much the same way that the earth revolves around the sun. It is believed that one

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COMPUTERWORLD

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Hitachi Users Unfazed By Charges Against Vendor

By Tom Henkel
CW Staff

While Hitachi Ltd. may have suffered some embarrassment from charges that company employees tried to buy proprietary IBM systems secrets [CW, June 28], it has not lost the faith of at least five of its users.

Users of National Advanced Systems, Inc.'s AS/7000 processors, which are manufactured by Hitachi, all said they are quite pleased with their machines' performance. Most users, in fact, said they would buy another Hitachi processor tomorrow if they were in the market for a new machine.

All five AS/7000 users said they expect the industrial espionage case to

have little or no effect on their ability to get parts, service or continued support from Hitachi. In addition, all indicated that espionage runs rampant in the computer industry and none felt Hitachi had done anything other computer vendors are not doing.

"That's what the plug-compatible industry is all about," according to Ned Palmer, DP manager at Lawyers Title Services in Orlando, Fla. John Schallhorn of Blue Cross/Blue Shield in Rochester, N.Y., echoed that sentiment, but expressed some concern that Hitachi may have some problems keeping up with IBM in supporting the extended addressing ver-

(Continued on Page 6)

Grand Jury Indicts Hitachi, 14 Employees

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — A federal grand jury considering evidence in the case involving an alleged Japanese scheme to steal IBM trade secrets [CW, June 28] last week indicted Hitachi Ltd. and 14 of its employees on one count of conspiring to transport stolen property.

In a separate action, the grand jury also indicted three non-Hitachi suspects on two counts each of transporting and receiving stolen property. Among the trio was a former employee of IBM and National Advanced Systems, Inc. (NAS), Raymond Cadet, whose alleged involve-

ment in the case had not previously been publicized.

The other two non-Hitachi suspects include Dr. Barry Saffaie, an NAS product planning manager, and Tabassom Ayazi, a 22-year-old Iranian student. Saffaie allegedly supplied Hitachi with several volumes of IBM's Adirondack Hardware Design Workbook, whose theft first brought the security problem to the industry giant's attention.

Word that the grand jury in nearby San Jose had returned its first indictments in the IBM trade-secrets theft case came during a Federal Bureau of Investigation press conference held June 30 in the federal court house here.

Also announced during the same conference was a decision to grant Mitsubishi Electric Corp. and its U.S. subsidiary a delay in presenting their case before the same grand jury. The postponement was requested to give Mitsubishi's lawyers a chance to familiarize themselves with the case and make a preindictment presentation to U.S. Attorney Joseph Russoniello here.

Mitsubishi and Hitachi, neither of which was aware of the other's activities, allegedly spearheaded the theft attempt, during which their employees purportedly paid undercover FBI agents \$648,000 in exchange for proprietary IBM product information. The illegal operation apparently ended late last month following a seven-month counterintelligence investigation that has brought criminal charges against 22 individuals.

(Continued on Page 6)

Once Opposed by Reagan

Congress Expected to OK Driver Register

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A controversial proposal for a national DP/telecommunications system to identify problem drivers, once opposed by the Reagan administration because of cost, privacy and constitutional rights concerns, now stands poised for congressional approval after heavy lobbying by the system's backers.

The Senate has already passed legislation to spend almost \$7 million over the next three years to establish and run a federally controlled computer-based National Driver Register (NDR), which would be, in part, a computerized criminal record sys-

tem. Similar legislation has been approved by the House of Representatives Transportation Committee and faces no real opposition to final passage.

Just one year ago, the NDR proposal was headed for demise after complete abolishment of the register was proposed by the Department of Transportation (DOT), whose National Highway Traffic Safety Administration (NHTSA) administers the current, primarily nonautomated NDR. DOT said its study of the register showed that upgrading it to the kind of on-line system proposed would be extremely expensive.

The study also indicated that the system would never be successful

without full state participation, which DOT said was unlikely given the cost and privacy problems [CW, June 29, 1981].

The present NDR, in operation for about 20 years, relies heavily on the mail to transfer from state to state information on individuals whose driving privileges have been revoked for one reason or another. In some cases, by the time a state learns a license applicant has lost his license in another jurisdiction, he has already received his new permit.

Proponents of an NDR upgrade, principally Rep. James Oberstar (D-Minn.), are pushing for a nationwide DP link between state licensing au-

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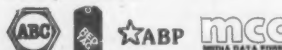
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For Cobol II, Monitoring

HP Adds Software for 3000 Series

By Lois Paul
 CW Staff

PALO ALTO, Calif. — Hewlett-Packard Co. last week unveiled a set of software programs to simplify Cobol II program development for users of its HP 3000 processor series. The company also announced a performance measurement package designed to spot application program bottlenecks occurring on the HP 3000.

The first package, HPToolset, in-

cludes a work space manager, a full-screen editor, an HP Cobol II program key and HP Cobol II symbolic debugging. It increases the programmer's effectiveness in program development, including creation, modification, compilation, execution and testing, HP claimed.

The work space manager reportedly frees the user from having to provide many names for versions of source files and avoids the need to remember file names. The full-screen editor

is intended to provide direct screen editing of text and to facilitate source code entry and modification.

The Cobol II interface program key consists of screen-labeled function keys that the vendor said enables the user to compile, prepare and run Cobol programs in separate steps or in a single step with the Go key.

The Cobol II Symbolic Debug helps locate runtime errors in HP Cobol II programs using variable names and paragraph names in the program instead of primitive-level memory locations and code addresses, according to HP. New capabilities include displaying and modifying data item values, setting breakpoints, trace/retrace execution flow and monitoring changes in data item values between Cobol paragraphs. HPToolset is priced at \$5,000. Customer support service is available for \$95 per month.

The application program sampler — APS/3000, as the performance measurement product has been named — identifies application program bottlenecks to enable programmers to write more efficient code, HP said. The sampler reportedly monitors the execution of several application programs at a time, if necessary, by taking statistical samples.

On-line, APS/3000 produces histograms that display the relative CPU time spent either directly in various portions of the user code or indirectly in exercising the operating system services, the vendor explained.

The software reportedly can use any HP terminal that is supported by the HP 3000 and runs on any HP 3000 in the MPE IV operating environment. This includes the HP 3000 Series II, III, 30, 33, 40, 44 and 64.

HP's Cobol II, Pascal, Basic, SPL and Fortran compilers will support APS/3000.

APS/3000 is priced at \$2,500; customer support services are available for \$45 per month.

Hewlett-Packard is located at 3000 Hanover St., Palo Alto, Calif. 94304.

'SAS,' Once Just for IBM Users, To Run on DG Eclipse Next Year

CARY, N.C. — SAS Institute, Inc. has announced that its Statistical Analysis System (SAS) software will be available next year for Data General Corp. Eclipse systems running under AOS/VSE.

The SAS package was formerly available exclusively for IBM machine environments.

SAS Institute recently signed a co-operative agreement with DG as a first step in transporting the software to non-IBM machines. When SAS Institute decided to adapt the package to non-IBM environments, DG was the first choice "because we were very impressed with the price-to-performance ratios of the Eclipse MV/8000 and MV/6000, combined with Data General's enthusiasm for making SAS available to its customer base," SAS President Jim Goodnight said.

A production version of SAS for the Eclipse series is scheduled for shipment in spring 1983, and versions of SAS/Econometrics and Time Series, SAS/Graph and SAS/Full-Screen Product are expected to follow.

The move to the non-IBM environment was prompted mainly by user requests, according to J. Patti Sigmon, manager of advertising and public relations for SAS Institute. On their December 1981 wish list, the

"Sasware Ballot," SAS users ranked the ability to run the software on minicomputers high on their list of priorities.

In response, SAS Institute formed a new division called Portable Systems. Design work for the portable version of SAS has been completed, and the group reported that the new language specifications differ only slightly from the current SAS grammar.

The changes, which reportedly will not affect IBM OS, CMS or DOS/VSE users in the immediate future, include placing titles in quotation marks and replacing the "DO OVER" statement with the more standard "DO I = 1 TO N" statement. The portable version reportedly will otherwise be equivalent to the current SAS version except for some system-dependent utilities.

The pricing for SAS on the Eclipse series will be compatible with that of SAS versions on IBM systems, Sigmon noted. For the first year and first CPU, the 1982 license fee is \$5,000, with each additional year priced at \$2,500.

DG will continue to provide support for the Eclipse and its operating system.

SAS Institute is located at SAS Circle, Box 8000, Cary, N.C. 27511.

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ADR WINS AGAIN!

ADR beats DB/DC rivals in 1981 Datapro ratings.

| Vendor and Package Name | Mean Average User Ratings | | | | | | | | |
|------------------------------------|---------------------------|------------|----------------------|-------------|----------------------------|---------------|----------------|----------------------|----------------------|
| | Reliability | Efficiency | Ease of Installation | Ease of Use | Vendor's Technical Support | | | Vendor's Maintenance | Overall Satisfaction |
| | | | | | Trouble-Shooting | Documentation | User Education | | |
| Applied Data Research, Inc. | | | | | | | | | |
| DATACOM/DB | 3.1 | 3.4 | 3.0 | 3.3 | 3.1 | 2.6 | 2.6 | 2.9 | 3.0 |
| DATACOM/DC | 3.2 | 3.4 | 2.0 | 3.6 | 2.0 | 2.4 | 2.2 | 2.4 | 3.2 |
| LIBRARIAN | 3.7 | 3.4 | 3.3 | 3.4 | 3.0 | 3.1 | 3.0 | 3.2 | 3.4 |
| LOOK | 4.0 | 3.5 | 3.5 | 4.0 | 3.7 | 3.0 | 2.5 | 3.3 | 3.5 |
| MetaCobol | 3.3 | 3.0 | 3.0 | 2.7 | 2.5 | 3.0 | 2.7 | 3.3 | 3.0 |
| ROSCOE | 3.6 | 3.5 | 3.1 | 3.4 | 2.9 | 2.9 | 2.7 | 3.1 | 3.2 |
| VOLLIE | 3.8 | 3.5 | 3.5 | 3.8 | 3.1 | 3.3 | 3.1 | 3.3 | 3.6 |
| Composite Average* | 3.5 | 3.4 | 3.1 | 3.5 | 2.9 | 2.9 | 2.7 | 3.1 | 3.3 |
| Cincom Systems | | | | | | | | | |
| Environ/1 | 3.8 | 3.4 | 3.0 | 3.2 | 3.0 | 2.8 | 2.8 | 2.8 | 3.0 |
| Mantis | 3.7 | 3.5 | 3.5 | 3.3 | 3.3 | 2.8 | 2.7 | 2.8 | 3.5 |
| Total | 3.4 | 2.9 | 3.0 | 3.0 | 2.6 | 2.7 | 2.8 | 2.8 | 3.0 |
| Composite Average* | 3.6 | 3.3 | 3.2 | 3.2 | 3.0 | 2.8 | 2.8 | 2.8 | 3.2 |
| Computer Corp. of America | | | | | | | | | |
| Model 204 | 3.2 | 3.6 | 3.3 | 3.4 | 2.2 | 2.6 | 2.6 | 2.6 | 2.8 |
| Composite Average* | 3.2 | 3.6 | 3.3 | 3.4 | 2.2 | 2.6 | 2.6 | 2.6 | 2.8 |
| Cullinane Corp. | | | | | | | | | |
| Cars | 3.2 | 2.6 | 2.8 | 3.2 | 3.2 | 2.6 | 3.0 | 2.5 | 3.0 |
| Culprit | 3.7 | 3.3 | 3.7 | 3.7 | 3.0 | 3.3 | 3.3 | 3.0 | 3.3 |
| IDD | 3.7 | 3.0 | 4.0 | 3.3 | 3.3 | 3.3 | 3.0 | 3.3 | 3.8 |
| IDMS | 3.6 | 3.2 | 3.3 | 3.2 | 3.3 | 3.1 | 3.3 | 3.2 | 3.3 |
| IDMS-DC | 2.6 | 2.0 | 2.6 | 2.8 | 1.8 | 2.0 | 3.2 | 2.2 | 2.4 |
| Interact | 3.3 | 3.7 | 3.5 | 3.8 | 3.2 | 3.0 | 2.7 | 3.2 | 3.4 |
| Composite Average* | 3.4 | 3.0 | 3.3 | 3.3 | 3.0 | 2.9 | 3.1 | 2.9 | 3.2 |
| IBM Corp. | | | | | | | | | |
| ADF | 3.3 | 3.0 | 3.0 | 3.0 | 3.7 | 2.7 | 2.7 | 3.3 | 3.0 |
| CICS | 3.3 | 2.9 | 2.5 | 2.8 | 2.9 | 2.9 | 2.7 | 2.9 | 3.0 |
| DMS | 3.0 | 2.6 | 3.0 | 2.5 | 2.3 | 2.3 | 2.4 | 2.3 | 2.5 |
| DATADictionary | 3.4 | 2.4 | 2.8 | 2.4 | 2.8 | 3.2 | 2.0 | 3.5 | 3.3 |
| DL-1 | 3.4 | 2.5 | 2.9 | 2.9 | 3.3 | 2.6 | 2.9 | 3.3 | 3.3 |
| ICOF | 3.4 | 3.1 | 3.3 | 3.2 | 3.0 | 2.9 | 2.8 | 3.2 | 3.3 |
| IMS/VS | 3.4 | 2.6 | 2.5 | 2.4 | 2.8 | 2.8 | 2.6 | 2.9 | 2.8 |
| TSO/SPF | 3.4 | 2.8 | 2.8 | 3.4 | 3.1 | 2.8 | 2.7 | 3.1 | 3.0 |
| Composite Average* | 3.3 | 2.7 | 2.9 | 2.8 | 3.0 | 2.8 | 2.6 | 3.1 | 3.0 |
| Infodata Systems | | | | | | | | | |
| Inquire | 3.0 | 2.6 | 3.3 | 3.4 | 2.6 | 2.3 | 3.2 | 2.8 | 3.2 |
| Composite Average* | 3.0 | 2.6 | 3.3 | 3.4 | 2.6 | 2.3 | 3.2 | 2.8 | 3.2 |
| INTEL | | | | | | | | | |
| System 2000 | 2.6 | 2.6 | 2.9 | 3.5 | 2.9 | 2.6 | 3.0 | 3.3 | 3.0 |
| Composite Average* | 3.6 | 2.6 | 2.9 | 3.5 | 2.9 | 2.6 | 3.0 | 3.3 | 3.0 |
| Software AG of N.A. | | | | | | | | | |
| Adabas | 3.6 | 3.2 | 3.2 | 3.4 | 2.8 | 2.8 | 2.8 | 2.9 | 3.2 |
| Complete | 3.6 | 3.2 | 3.2 | 3.4 | 2.2 | 2.8 | 2.0 | 3.0 | 3.2 |
| Natural | 3.6 | 3.0 | 3.4 | 3.7 | 2.7 | 2.4 | 2.6 | 2.7 | 3.4 |
| Composite Average* | 3.6 | 3.1 | 3.3 | 3.5 | 2.6 | 2.7 | 2.5 | 2.9 | 3.3 |

Source: December 21, 1981 Computerworld Report on DATAPRO Ratings. These ratings are an average of all responses for the product: 4 = Excellent; 3 = Good; 2 = Fair; 1 = Poor.

*Composite Average for each characteristic is computed by adding scores for all products and dividing by the number of products.

**Composite average for 9 characteristics is computed by adding all 9 composite averages and dividing by 9.

From 1973 to 1979 ADR software products received 18 Datapro awards — more than any other software or hardware vendor for IBM mainframe computers. In 1980 ADR achieved higher ratings than any of its DB/DC competitors. And in 1981 ADR's integrated products again received higher composite ratings than its DB/DC competitors. ADR continues to beat the competition because:

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BPSS Start-Up Delayed Until July 31

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — AT&T has agreed for the second time to defer the start-up of the Bell Packet-Switched Service (BPSS), the underlying network for the company's new "smart network" offerings. The BPSS tariff was scheduled to become effective July 1; the new date is July 31.

BPSS is one result of the Federal Communications Commission's (FCC) Second Computer Inquiry Decision, which allows AT&T to offer "enhanced" (computer-based) services, free of regulation, through a "fully separated" subsidiary.

That subsidiary, American Bell, Inc. (ABI), along with its first offering — the Advanced Information Service/Net 1 (AIS/Net 1) — was announced several weeks ago [CW, June 21].

AIS/Net 1 is essentially a renamed

version of the Advanced Communications Service (ACS) unveiled by Bell last fall. BPSS, a packet-switched network that AT&T's Long Lines Division will offer at tariffed rates, will support AIS/Net 1 plus other offerings of AT&T and/or its subsidiaries, AT&T said.

Under Attack

The BPSS tariff has been under vigorous attack from ABI's prospective competitors since it was unveiled in March. They contend that the tariff would allow Long Lines to perform protocol conversion — an "enhanced" service which under the Computer Inquiry Decision cannot be provided by a regulated entity such as AT&T Long Lines.

There are also questions about the proposed charges for BPSS. A minimum configuration, one switch and two ports, would cost \$77,000 per

month; the tariff also includes "service establishment" charges of \$85,540 per switch plus \$500 per port.

In statements to the Federal Communications Commission, two of BPSS' major critics — GTE Telenet Corp. and Tymnet, Inc. — have insisted that these rates were made particularly high to keep anyone but ABI from using BPSS facilities and thus exploiting any economies growing out of such use.

For example, the BPSS tariff as presently drafted covers only switching facilities. Transmission charges between BPSS nodes and between the network and its customers would be tariffed separately.

Typically, an AIS/Net 1 end user would connect his terminal to an ABI service center that, in turn, would be linked to the BPSS network by 56K bit/sec Digital Dataphone Service

(DDS) channels. Competitors such as GTE Telenet or Tymnet, Inc. would employ similar 56K bit/sec channels to interconnect their nodes.

However, these vendors contend that if a recently proposed tariff change is accepted by the commission, their customers will have to pay significantly more than ABI's customers for equivalent service.

The tariff change to which they refer establishes a charge of \$180 per month to connect a 56K bit/sec DDS channel to a BPSS node and a charge of \$908 per month for all other connections.

Main Reason

The main reason for this lower price, according to AT&T, is that the BPSS switching computer will be located in Bell central offices, where DDS channels terminate, and thus costs will be substantially less than for the other types of connections.

But, according to GTE Telenet, the tariff change means a 56K bit/sec link between two BPSS nodes would cost \$360 per month, while the same link connecting two Telenet nodes would cost \$1,816 per month.

A 56K bit/sec access line between a Telenet user's premises and the Telenet network node would also cost \$1,816.

If the same user employed the same facility to access BPSS directly (an option available under AIS/Net 1), it would pay only \$1,088 per month (\$908 plus \$180), according to GTE Telenet.

Meanwhile, independent manufacturers of terminal and modem equipment are up in arms over AT&T's requirement that all DDS service must be provided through a Channel Service Unit (CSU) obtainable only from AT&T.

The CSU is a protective device whose functions can be "equated" to those of the Data Access Arrangement and other coupler devices that had to be obtained exclusively from the phone company until 1976, when the FCC found this requirement unnecessary and anticompetitive, explained Robert S. Davis, corporate planning vice-president at General Datacomm Industries, Inc. in Danbury, Conn.

Bell Labs Develops Working Processor Based on Josephson Junction Technology

By Tom Henkel

CW Staff

HOLMDEL, N.J. — Josephson junctions, supercooled circuits that are much faster than conventional semiconductor devices, have been getting more attention lately as a possible alternative to conventional semiconductor technology.

IBM, for example, has been researching the Josephson effect for some time, and a video presentation at last month's National Computer Conference marked IBM's first public indication that it would someday market a processor based on Josephson circuits.

In another recent announcement, Bell Laboratories here said it has developed a working data processor that contains the most complete use of Josephson junctions ever built. The processor, which consists of approximately 600 Josephson junction circuits, is being used for research into image-processing technologies.

While Bell's processor operates at the relatively slow cycle time of 75 nsec, researchers say that much of that cycle time involves getting electric signals to and from the Josephson processor, which is immersed in a bath of liquid helium in a container about the size of an umbrella stand. According to Bell, the actual switching time for the processor is about 2 nsec, slightly faster than current semiconductor technology.

Josephson Effect

But it is much easier to create the Josephson effect — a condition where tiny switches lose virtually all resistance when cooled to near absolute zero — in a laboratory than it is to build a reliable and economically feasible processor for the commercial market.

Dick Slusher, department head of the Interface Electronics Research Department at Bell, estimated that it may take 15 years before Josephson devices challenge semiconductor technology.

A Josephson processor could be on the commercial market in as few as

five years, Slusher said, but there are some production problems that must be overcome first. One of the primary problems is finding an adequate substrate on which to build Josephson circuits.

Unlike circuits based on silicon and gallium arsenide, Josephson circuits do not use semiconductive material. Finding a substrate that can withstand the rigors of operating at absolute zero (about -400°F), is reliable and which can be easily mass-produced, has been a stumbling block for Josephson technology, Slusher said.

Bell Laboratories is currently using a silicon substrate with a niobium insulator and a lead-indium gold alloy coating. Slusher said that the element niobium is a hard substance that does not become distorted when cooled.

"I'd like to make all-niobium circuits, but we've had trouble with the oxide in niobium. One would like a nice interface between a metal and an insulator, and niobium is not ideal in that regard," Slusher said, but "we recently had a success with an aluminum overcoating of niobium."

Another Problem

Failures in Josephson devices are another problem. Since the processor is immersed in liquid helium, repairs can be a problem. However, lasers have proven effective in making alterations to Josephson circuits, Slusher noted.

Still another problem involves taking advantage of the extremely fast switching speeds of Josephson circuits. To ensure that currents flowing through the processor remain at the speed of light, all the circuits in the Josephson processor must be lined up in a painstaking process, Slusher said.

In addition, since silicon-based semiconductor technologies are fundamentally compatible, processor manufacturers can take advantage of different manufacturing techniques. For example, devices based on high-speed transistor-transistor logic

(TTL) can be used for cache memory, while slower but more energy-efficient technologies can be used for read-only memories.

Josephson devices, since they are immersed in liquid helium, cannot be directly connected with room-temperature, silicon-based circuits, a problem that accounts for the Bell Laboratories processor's current 75 nsec cycle time, Slusher said.

The chip used in the Bell Laboratories experiment employs 548 Josephson junctions arranged in pairs as Josephson Atto-Webber Switches (Jaws).

The processor is being used in a video-image compression experiment being carried out by Arun Netravali and Stuart Tewksbury. The goal of the research is to develop a processor that can recognize human speech, process images rapidly or be used in large-scale simulations such as those used for weather forecasting.

Bell Laboratories claims the processor is the most complete application of Josephson junction circuits to date.

Computer Sketches Far-Off Stars

(Continued from Page 1)

star's close proximity to another star may be the cause of large star spots, Vogt said.

"The stars we're looking at rotate every four to six days," he said. This comparably fast rotation (our sun rotates on its axis every 30 days) may cause changes in the magnetic fields of the star, which then creates the spots and large flares.

"The question is: 'Are these spots scaled-up versions of sunspots or are they something else?'" Vogt said. "The point is to find out if they are different."

The spots are certainly larger than those on our sun — they would not be visible from so far away if they were. "The biggest spots cover 40% to 60% of the surface of the star," Vogt said. "If a spot that large appeared on our sun, the earth would go through an ice age within 20 days. Virtually

all life would cease on earth."

These stars also experience violent flares that may be similar to the solar flares of our sun, but they are much larger also. "If the sun flared like these stars, it would take the atmosphere right off of Venus," Vogt said.

RS CVn stars are found in many parts of the sky, but they are just faint enough not to be seen with the naked eye, Vogt said. The closest star to Earth is about four light years away, but at 100 light years away, the RS CVn stars are "by galactic standards just around the block."

The VAX is the key factor in this research, Vogt said; the complex matching of data can only be achieved with a computer. Using the VMS operating system, a team of 10 at the Lick Observatory run specialized software from the National Center for Atmospheric Research in Boulder, Colo.

To Replace Part of DDS

AT&T Files Tariff for Terrestrial Digital Service

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — AT&T last week filed a tariff for a 1.54M bit/sec Terrestrial Digital Service (TDS) that would replace a portion of the company's present Dataphone Digital Service (DDS).

TDS rates for distances of 100 miles or less are generally higher than DDS rates while longer haul circuits are generally lower, the company said.

Under the TDS tariff, which carries a Sept. 28 effective date, a short-haul customer now paying \$2,180/mo for a 30-mile, 1.54M bit/sec DDS circuit would be charged \$3,115 for similar facilities. A long-haul customer with an 800-mile channel, now costing \$62,075/mo, would pay about \$26,545 under the TDS schedule.

TDS is to be made available "throughout most of the country — wherever suitable digital transmission facilities exist," AT&T said. Long-haul DDS is currently available in 93 metropolitan areas.

The phone company is "currently reviewing the possibility" of offer-

ing a satellite-supported version of TDS.

Charges for a TDS channel contained within a "local rate center" (typically a metropolitan area) involve a recurring monthly fee of \$1,030 plus a nonrecurring charge of \$361, but only when the channel connects two customer premises. If one end of the channel terminates at a Bell central office, the recurring charge is \$580/mo.

Charges for TDS service between rate centers will be based on fixed and per-mile charges. For a channel of 16 or fewer miles, the fixed fee is \$528 and the per-mile charge is \$48.35. For a 17 to 50 mile channel,

the rates are \$556 and \$46.60, respectively; for greater distances, they are \$1,386 and \$30.

Controversial Provisions

Two provisions of the TDS offering are believed certain to raise the hackles of AT&T's competitors. One requires the use of a Channel Service Unit (CSU), obtainable exclusively from AT&T, between a customer's terminal and the TDS channel. However, where the latter interconnects an AT&T operating center with that of another telephone carrier, no CSU is required.

Satellite Business Systems (SBS) has been arguing for a long time that the

CSU requirement, long embedded in the DDS tariff, is unfair. Another opponent of the CSU requirement is the Independent Data Communications Manufacturers Association (IDCMA), which represents the nation's major independent modem makers.

The IDCMA insists there is no technical necessity for making AT&T the sole CSU supplier and that the requirement's chief effect is to give the phone company an unfair competitive edge in marketing its digital channel termination equipment — an edge that will grow as use of such channels increases and as AT&T introduces information offerings.

IBM Discounts Volume 3350s

RYE, N.Y. — IBM has extended its volume-discount purchase plan to include the 3350 disk drive.

Under the plan, users who purchase five to 14 units will receive a 15% discount. Purchases of 15 to 29 units will be discounted 20%; purchases of 30 to 49 units, 25%; and 50 or more units, 30%.

Industry analysts said the move appears to be part of IBM's continuing effort to offer volume discounts on key products. Virtually all of IBM's mid-range and smaller systems and peripherals are available on a volume-discount arrangement.

Analysts speculated IBM will probably offer its largest systems and peripherals on a similar arrangement.

ACR Releases 1982 Directory

PHOENIX — Applied Computer Research, Inc. has released its 1982 *Directory of Communications Management*, which is said to contain a listing of 4,000 executives in the largest corporations and government agencies with responsibility for their organizations' communications activities.

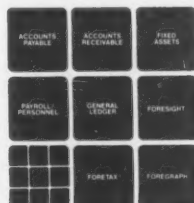
The directory includes *Fortune* magazine's "double 500," the six groups of 50 nonindustrial companies and other commercial and governmental agencies. The main section of the directory is organized by city within state and alphabetically by company name or agency within 12 different industry classifications.

The summer edition of the biannual directory costs \$75/copy or \$120 for an annual subscription. More information is available from Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.



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Expects Little Change for Five Years

Researcher Scoffs at Japanese Threat to U.S.

By Jeffery Beeler

CW West Coast Bureau

SAN JOSE, Calif. — Recent allegations that two of Japan's premier electronics firms conspired to steal IBM trade secrets [CW, June 28] have revived American fears of a massive Japanese assault on the U.S. mainframe business. But some observers felt that the American computer industry, particularly IBM, currently

poses much more of a danger to the Japanese than Japan does to the U.S.

"All this talk of the Japanese threat to the U.S. mainframe market has been grossly exaggerated," said Brian Jeffery, Strategic, Inc.'s director of computer information research, during an interview last week.

Japanese suppliers of large-scale processors currently account for only a negligible percentage of the U.S. total installed mainframe base. Moreover, Jeffery said, little change in the market picture is expected for at least another five years.

Even within their own country, where roughly a quarter of the overall systems business belongs to IBM, the Japanese have yet to establish clear-cut market superiority, according to Jeffery.

Jeffery's portrayal of Japan's computer industry as beleaguered and highly vulnerable may come as a bit of a surprise to some Americans, who nowadays seldom hear Japanese firms described as anything but spectacularly successful. Having already established a significant presence in

the U.S. domestic auto and consumer electronics industries, the Japanese have been widely believed to be preparing for a similar — and imminent — invasion of the American mainframe market.

But the fact of the matter is that in their efforts to compete with IBM, the Japanese still find themselves very much on the defensive and are a long way from going on the attack, Jeffery said.

"The Japanese are very much concerned at the moment about what IBM is going to throw at them in their own domestic market," he said. "Back during the 1970s, when the 370 series was introduced, it nearly wiped out the Japanese computer industry altogether, and even today they face a hard uphill struggle to make any headway against IBM at all."

Simple Reason

The reason for Japan's unfavorable competitive position is simple. With annual revenues exceeding \$25 billion, IBM boasts at least 10 times the

sales of all its Japanese rivals combined. To make matters even worse, IBM's business practices are becoming increasingly aggressive in the wake of the federal government's recent decision to drop its long-standing antitrust suit against it.

Given their current difficulties, "the Japanese realize it would be virtually impossible for them at present to set up organizations to market their mainframes directly in the U.S.," Jeffery said.

Jeffery's comments came hard on the heels of recent disclosures that a group of Japanese electronics company employees allegedly paid \$648,000 to obtain proprietary IBM product information. The suspects, most of whom work for Hitachi Ltd. and Mitsubishi Electric Corp., were charged late last month with conspiracy following a seven-month investigation involving undercover Federal Bureau of Investigation agents.

Jeffery characterized the alleged Hitachi and Mitsubishi espionage attempts as an "isolated case" that marks a sharp departure from Japan's usual methods of gathering industrial intelligence. "Most of the time, when they're looking for information, the Japanese behave in a way that isn't particularly different from American companies," he said.

News of the Hitachi-Mitsubishi affair — and the FBI's tactics in bringing it to light — have triggered a "very negative reaction" in Japan, the market researcher added. "The Japanese feel they're competing with an extremely large and powerful U.S. company that hardly needs any assistance from the American government."

Jury Indicts Hitachi, Others

(Continued from Page 1)

All 17 of the suspects named in the grand jury's indictments were allegedly involved only in the Hitachi side of the espionage caper and were in no way associated with Mitsubishi.

Last week's developments marked the first time that Hitachi itself has been charged explicitly with any wrongdoing in the case. Previously, the only suspects to be accused in the affair were individual employees.

On June 22, the FBI filed complaints against 14 representatives of both Hitachi and its U.S. subsidiary, Hitachi America Ltd. Those 14 suspects were the same ones named in last week's grand jury indictments.

Five of the Hitachi people were arrested last month by the FBI and later released on bail. The other nine remain in Japan while the U.S. Justice Department and the Japanese Ministry of Justice discuss arrangements for possible extradition.

Thus far, the U.S. and Japanese conferees have yet to resolve the extradition question, "and neither side has set any specific deadline by which an agreement has to be reached," Russianiello said.

In the U.S., both Hitachi and Mitsubishi last week declined all comment on the case. In Japan, however, the two firms have continued to maintain their innocence.

Correction

In "DP Security Exec Praises FBI and IBM: Terms Industrial Espionage 'Fact of Life'" [CW, June 28], James G. Lightburn referred to a technology theft case in which Mitsubishi Electric Corp. and Celanese Corp. were mentioned. According to Lightburn, the companies actually involved were Mitsubishi Chemical Industries, Mitsubishi Plastics Industries and Celanese Plastics Co. of Greer, S.C.

Lightburn also said that his original date concerning the case, "in the mid-70s," should be corrected to 1979. In addition, the Mitsubishi companies did not receive close to \$4 million or \$5 million estimated worth of information as originally stated, but several hundred million, according to Lightburn. Mitsubishi Plastics Industries was fined \$300,000 as a result of pleading "no contest" to two counts of an eight-count indictment, Lightburn said.

Hitachi Users Not Fazed by Case

(Continued from Page 1)

sions of the MVS and VM operating systems.

Nevertheless, Schallhorn said he would "absolutely" buy another Hitachi processor, probably the larger AS/9000 processor, when the time to expand arrives.

Gene Brewer, DP manager for Florida's Dade County Public Schools, said Hitachi has a firm commitment to the U.S. computer market and is not about to let the current setback have a lasting effect. Brewer said Hi-

tachi's problem now is basically an image problem, but its products still have a good reputation.

Elson Weiderman, DP manager at the University of Rhode Island, believes Hitachi AS/7000 processors are better than the IBM 3033 processors that the Hitachi machines emulate. Because Hitachi is accused of trying to buy secrets for processors more technologically advanced than the AS/7000, the case has had little affect on his shop, Weiderman added.

Congress Expected to OK Driver Registry

(Continued from Page 1)

thorities that would be administered by NHTSA. Licensing agencies would have on-line access to the national data base of problem driver records through terminals at licensing facilities.

A recent study by DOT said such a system would cost approximately \$71 million over a 10-year period.

Besides the cost considerations, opponents of the NDR upgrade proposal argue that licensing is a state rather than a federal function, that the expanded NDR would amount to a national data bank, which has always been opposed by Congress, that it would be ineffective without full state cooperation, and that in general it would not be effective because, according to a NHTSA report, 80% of all suspended drivers continue to drive whether or not they can obtain another license in a different jurisdiction.

After reviewing the pros and cons of the NDR, DOT last year sent a letter to Congress recommending that the NDR be abolished. Following that decision, however, NHTSA administrator Raymond Peck was approached by congressional supporters of the NDR upgrade and by organizations devoted to getting drunk drivers off the roads, several

of which groups have made the NDR upgrade a primary goal. Following their presentations, an agency spokesman said, Peck decided to reverse his earlier decision to not support the upgrade.

According to NHTSA spokesman Bob Boaz, the agency was persuaded that the federal government should take the lead in developing the NDR because the states could not do it themselves. And, Boaz said, NHTSA now feels that "if the system really becomes a valuable, on-line system, all the states will want to participate."

Little Opposition

Once the NDR supporters succeeded in identifying the system upgrade with the anti-drunk-driving movement, which is very popular now in Congress and in the administration, opposition to the register was easily overcome. The NDR upgrade bill in the Senate was merged with a bill giving states grants if they would adopt strict laws against drunk driving, legislation that passed May 11 with almost no scrutiny of the NDR provision.

In the House, Oberstar has appended his NDR bill to a highway construction bill that has been cleared for final action and will be brought

up as soon as the House Ways and Means Committee decides on how to raise funds for the highway bill. However, an aide to Oberstar said that if the highway bill does not come up before the end of the year, separate NDR legislation may be pushed in the House.

The Oberstar bill calls for a four-state pilot test of the upgraded NDR proposal, the idea being that other states will want to join the system if the pilot proves successful. This proposal, however, does not address the many reasons cited in the recent DOT study for limited state participation, particularly cost considerations and state privacy laws that would prohibit cooperation.

In addition to the lack of hearings on the NDR, the proposal has not been addressed by the Senate and House Judiciary Committees, despite the fact that the upgraded NDR would constitute a national computerized criminal record system with full federal-controlled message-switching functions.

In this regard, the NDR would be similar to the Federal Bureau of Investigation's Computerized Criminal History system, which both committees have watched closely, insisting no message-switching capabilities be developed.

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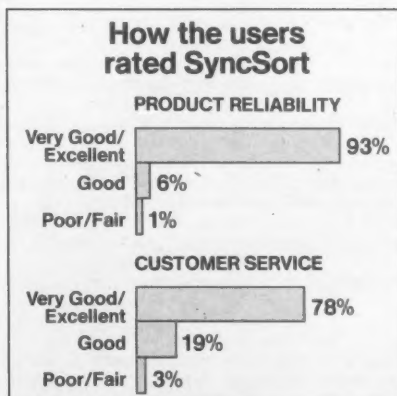
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What to Do When Packages Don't Work? DP Managers Tell How They Cope

By Lois Paul
CW Staff

HOUSTON — What do you do when a software package you have purchased does not work?

This question was posed to several DP managers who provided some tips to attendees at University Computing Co.'s (UCC) 1982 Systems Software Conference here last week.

Don Henry, staff manager for Southwestern Bell Telephone Co.'s St. Louis-based facility, said that a major problem is communication

CW At UCC '82

with the vendors involved. This becomes particularly thorny when the user's view of his problem and the vendor's understanding of it do not coincide, observed Henry, whose group supports eight data centers located in five states.

Southwestern Bell has a centralized

maintenance facility that handles contract negotiations on-site and controls implementation of new releases as well as testing of purchased packages and systems developed in-house. The latter is handled at a test site, which includes an IBM 3081 and a 3033.

Henry recommended standardizing communication with the vendor through the use of a particular form. His group has developed a problem-tracking system that he said gives them an edge when they bring their requests or complaints to the vendor of the software.

"If you can put in black and white in front of a vendor that you have problems and these have been reported, it carries more weight," he said.

A common vendor response to reported software problems is that they will be handled in the next release of the product, he said. However, if a firm cannot afford to wait and it has documented the problem, it may be able to swing an early release, he noted.

Problem-Reporting System Used

G. Peter Sannerud, assistant director of data production for Burlington Northern Railroad in St. Paul, Minn., said that his firm's biggest concern is the impact of problems they may encounter with the approximately 100 software packages they are running. His group has instituted a problem-reporting system that makes operations personnel responsible for defining problems and classifying them as either something the firm can live with, something that can be circumvented or something that requires a call to the vendor's 24-hour hotline.

The problem report remains open until it has been resolved. A meeting is held every morning to provide an update on reported problems.

In terms of implementing software changes and new releases, Sannerud's group tests the system for one week before propagating the change across the firm's other three mainframes. The change is documented so if problems occur, it can be determined whether they were caused by the new release.

A weekly meeting held to report on problems is open to user departments, he continued. Problems not deemed major are scheduled at this time and a status report is submitted to the users.

In response to audience questions, Henry noted that his firm has four severity levels for problems:

- System is not functioning.
- Package is multifunctional and one of its components is not working.

• A problem has occurred and resolved itself, but the cause is not yet known.

• Software does not work quite the way the firm wants it to work, but it is working. Most requests for enhancements fall into this category.

Using a centralized maintenance system "works, but it takes a lot of effort and a lot of time," Henry said. "It also takes an awful lot of expertise on your part."

Interview Users Before Buying Packages: Exec

By Lois Paul
CW Staff

HOUSTON — "A lot of companies miss the most critical part of [software] acquisition, which is interviewing the user to determine what his needs are — your understanding and his perception may be totally different."

That warning was issued here last week by Louis Ivy, vice-president of technical services for First City Services Co. of Houston. Ivy told attendees at University Computing Co.'s (UCC) 1982 Systems Software Conference that understanding your users' needs and evaluating both product features and vendor contract requirements are all critical when you are planning to acquire a software package.

Ivy suggested that DP managers flowchart a system that will replace a manual function to show users how it will work. The flowchart would also show its effect on savings and cost avoidance, which he defined as the two ways to justify software acquisition.

Once the users' needs are defined, the DP manager can determine if the solution is a one-time "quick and dirty" job or a long-range program.

The second step, according to Ivy, is to take the user requirements to a technical group for development of specifications.

Standard Evaluation

His company limits the subsequent package evaluation to three products. In addition, First City has developed a standard evaluation form that checklists the areas of consideration when evaluating vendor software.

The firm's checklist suggests the following steps:

- Look at the compatibility of the package with current hardware and software. What other hardware or software will be needed to support the product?
- Determine if the system documentation is adequate.
- Make sure the vendor has a good reputation in the marketplace and is in good financial condition.
- Determine in which languages the product is provided.
- Examine maintenance policies.
- Decide what staffing levels you will need to support the product.
- Determine if design of the package allows you to do backup and recovery for contingency planning.

Ivy's firm assigns a weighted value to each of these considerations and then totals the "scores" of each vendor to determine which has the best features to fulfill the users' needs.

The next step — a very important one, Ivy said — is to obtain a copy of the legal papers and contracts involved in acquisition of the leading product and have these reviewed by your legal consultants.

Then consider the cost of acquisition, including startup and installation costs, which sometimes are overlooked. Determine the date for delivery, he continued, and set up an implementation schedule that is run by a project team and includes milestones that will be checked.

Data Center Exec Offers Solution to Remote Snarls

By Lois Paul
CW Staff

HOUSTON — How do you improve productivity when you are one of three data centers for a national firm and you are servicing 15 major customers at remote sites across the country?

This was the dilemma facing Jim Devlin as chief of operations methodology for General Dynamics Corp.'s Eastern Data Center in Norwich, Conn. His solution, which he described to attendees at University Computing Co.'s (UCC) 1982 Systems Software Conference here last week, was a four-step process:

- He determined which problems he wanted to solve.
- He prepared his people for the solutions.
- He selected his goals.
- He developed a plan to meet those goals.

In conjunction with a West Coast and Texas-based data center, the Eastern Data Center basically acted as an internal DP service bureau that provided all the DP support for General Dynamics' operating units. His data center was using two IBM 3033 mainframes and a Sperry Univac 1100/80 system for an open shop environment.

Devlin looked at the computer room as an automated factory. "I felt that if you could automate the computer room, you would achieve productivity gains," he explained.

Devlin's goal was to determine where he could improve productivity by changing an operations function. In each case he worked to win the support of the people affected by the proposed change, gathered the people talents needed to effect the change and looked at the hardware and software that were available for implementing the change.

He made the following 10 changes:

- Automated JCL development, which he said eliminated 80% of the JCL errors through use of a home-grown JCL generator.
- Automated the report distribution process. This provided better control over who gets reports through use of a master scheduling file. In addition, he attached a mail ticket to the first page of every report with information on the recipient, which he said has cut down the number of lost reports by 90%.

- Developed system flow. In this

way flowcharting becomes part of the application.

- Developed a major operations education program to reverse the image of operations people as merely "button pushers who do not know what they are doing."

- Instituted restart management to eliminate reruns, using UCC 15 and then UCC 11 packages.

- Automated tape file management by adding the UCC One Tape Management System.

- Instituted operations management consulting, which he said resulted in 95% of the jobs passing his group's system testing the first time through.

- Became involved in network design.

- Automated date and control information through development of IBM TSO question-and-answer screens that aid users in entering this "nuisance information."

- Automated the scheduling process to determine what jobs were going to be requested by customers and when these would be due.

Devlin said that a 1979 audit of his data center reported that it "had one of the best production control systems." The production control environment has been further upgraded since that positive report.

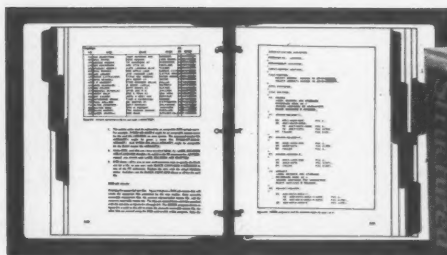
Masters Earned In Software At Seattle U.

SEATTLE — Twenty-two pioneering graduates of what Seattle University calls the first Master of Software Engineering (MSE) program in the world received their degrees last month.

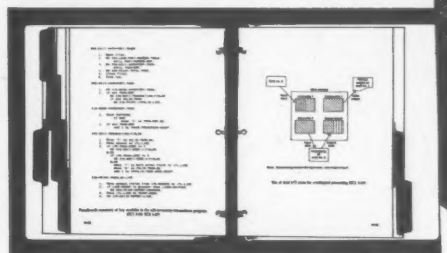
Seattle University began its three-year master's degree program in 1979 in response to the demand from industry for trained software professionals. The MSE program guides students in developing both technical and managerial skills in software technology.

The program was initiated after discussions between Seattle University administrators and several Seattle-area firms. The companies indicated a need for personnel highly trained in management and development of software operations.

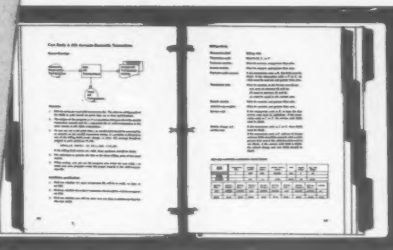
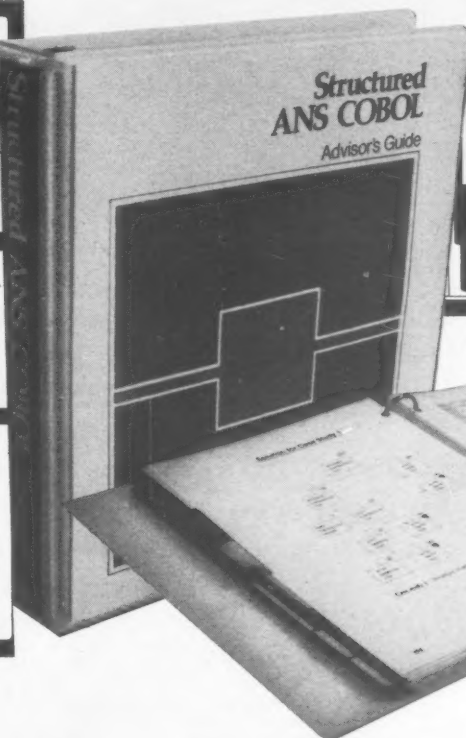
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Partial Contents

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(2) Structured Programming Techniques
(3) Diagnostics and Debugging (4) COBOL for Sequential Files
Part 2: (1) Structured Programming Techniques
(2) Table Handling (3) Subprograms (4) COPY Library (5) Sort/Merge Feature (6) COBOL for Indexed Files

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4 chapters, 106 pages

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The first section gives standards and guidelines for a structured COBOL shop. So once students have learned structured techniques, they can refer to the Cookbook to refresh their memory whenever they have a program-development question.

The rest of the book presents complete solutions for four business programs...solutions to use as models for new programs. In this way, the Cookbook can have a major effect on programmer productivity...as you'll see if your trainees use it when they work on the case studies from the Advisor's Guide.

16 tabbed sections, 221 pages

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COB-1

To Battle Industry Confusion

Survey to Examine Real-World MVS Applications

By Lois Paul
CW Staff

VIENNA, Va. — Prompted by a perceived lack of perspective and understanding of performance management and capacity planning in the IBM MVS environment, a software company here decided to get a handle on these functions by conducting its own survey.

"There is so much confusion in the industry and there has been for a long, long time," William L. Witzel, director of Morino Associates, Inc., said, explaining the reason for the "MVS Worldwide Performance Management & Capacity Planning Survey."

He explained that although DP managers are hearing certain things from vendors and industry "gurus" about performance management and capacity planning, these concepts often are far from their real-world applications.

Real World Opinion

"There seems to have continually been this dichotomy, this difference of opinion between what happens in the real world and what you might read in the popular press or in the literature," he said. "It seems that from a manager's perspective it would be well to lay out that this is what people are doing and why, and never mind what you may read."

Witzel sees the survey results as providing a real-world picture for users of the MVS operating system.

The survey was just initiated on May 17, and approximately 85 responses have already been received by MVS installations interested in participating, he said.

Witzel hopes to base the survey results on responses from between 350 and 500 MVS installations.

A problem he sees with the survey is a potential bias in favor of installations that are doing something constructive in the areas of performance management and capacity planning.

"If you ask someone to tell you in survey form to put his time in, the person who is doing something, or who believes he is doing something, will be quick to respond, relative to the person who is doing nothing," Witzel explained, adding, "You get a very biased look at the world which, if we don't do something about it, will make it seem as if everyone is doing something in this area."

Firm's Proposed Solution

The firm's proposed solution is to come up with a statistical method that will bring in a base of MVS installations that have not responded through a telephone survey to make the results statistically valid. "So when we do finally publish the final report, we will get as true or as statistically significant a set of results as we can about the real world," Witzel explained, noting that the tabulations will be handled by an outside firm.

What is Morino Associates gaining through this endeavor? Witzel's hope is that people will perceive Morino Associates as a firm that is concerned about performance man-

agement and capacity planning and "recognize that the only ax we have to grind is that somebody has to do it." He added, "Without a doubt there is a continuous increase in our image in the marketplace."

Survey Criticized

He admitted the survey idea has been criticized as being crazy or as representing only a measure of the amount of lethargy in the world.

Vendor responses to date have been positive, however, and Witzel is confident the survey will be recognized as a worthwhile effort.

The firm has dedicated three full-time employees to the project and will be recruiting an additional 10 part-time workers for data entry, scoring and developing models out of the narrative questions. "That would be the incremental added expense. Our other people will be

pulled off other work, but we will just absorb that," he said, noting that as many as 20 people may be working on the survey at any one time.

Witzel said they have not yet established a cutoff date for accepting survey responses. However, they do plan to publish the results of the survey in the first quarter of 1983. Witzel said that all participating installations will receive a free copy at that time.

Survey Asks About Planning, Management

VIENNA, Va. — So you are an MVS installation that is interested in performance management and capacity planning?

Morino Associates, Inc. has a survey tailor-made for you.

The "MVS Worldwide Performance Management and Capacity Planning Survey" consists of 12 pages that include a general review of performance management and capacity planning functions and specific questions pertaining to the performance management and capacity planning staffs.

There is an installation overview, followed by a list of 53 program products and facilities from 23 vendors or sources (see box at right). "Answers to this question will provide a gross quantification of what performance management and capacity planning practitioners are utilizing as their primary and secondary information sources," the researchers explained.

The survey includes in-depth questions on performance management and capacity planning functions. It also requests comments from participants, who are invited to list any questions that should have been included.

The second part of the survey asks specific questions about the background, education and training of the performance management and capacity planning staffs.

The surveys are being mailed out in response to requests from MVS installations. Respondents are given four weeks to fill them out and return them.

Further information about the survey can be obtained by contacting survey coordinator George H. Swanson at Morino Associates, Suite 602, 8133 Leesburg Pike, Vienna, Va. 22180.

Tools and Data Sources

4. For both PM and CP show the use of tools and data sources on the list below. Use the following codes (1 and 2):

- 1—for a primary used product or facility (currently used or have plans to use).
- 2—for a secondary or occasionally used product or facility.

Please place the codes in the appropriate PM and/or CP column. The ID # is for possible references in questions 12 and 20. The potential use of these references will be described in the questions.

Products & Facilities—Hardware & Software

| Vendor/Source | Product/Facilities | PM | CP | ID.# |
|------------------------------------|--|----|----|------|
| Applied Data Research | LOOK | — | — | 1 |
| Boole & Babbage | CMF Realtime | — | — | 2 |
| Boole & Babbage | Control/CICS | — | — | 3 |
| Boole & Babbage | Control/IMS | — | — | 4 |
| Boole & Babbage | Control/SMF | — | — | 5 |
| Boole & Babbage | Comprehensive Management Facility (CMF) | — | — | 6 |
| Boole & Babbage | Control/IMS Realtime | — | — | 7 |
| Boole & Babbage | Resolve | — | — | 8 |
| Boole & Babbage | Resolve CICS | — | — | 9 |
| BCS | CICS-MON | — | — | 10 |
| BCS | SARA IV | — | — | 11 |
| BCS | Terminal Input Output Simulator (TIOS) | — | — | 12 |
| BGS | BEST/I | — | — | 13 |
| BGS | CRYSTAL | — | — | 14 |
| BGS | CAPTURE/MVS | — | — | 15 |
| CAPEX | Manage IMS | — | — | 16 |
| CAPEX | Plan IV | — | — | 17 |
| CAPEX | 4TUNE | — | — | 18 |
| Candle Corp. | Omegamon | — | — | 19 |
| Candle Corp. | DEXAN | — | — | 20 |
| Candle Corp. | Omegamon/CICS | — | — | 21 |
| Duquesne | Job Analysis & Billing | — | — | 22 |
| Duquesne | Quantitative Computer Management (QCM) | — | — | 23 |
| IBM | IMS Log | — | — | 24 |
| IBM | IMS (DC) Monitor | — | — | 25 |
| IBM | CICS/VS Performance Analyzer | — | — | 26 |
| IBM | Service Level Reporter (SLR) | — | — | 27 |
| IBM | System Management Facility (SMF) | — | — | 28 |
| IBM | General Trace Facility (GTF) | — | — | 29 |
| IBM | PARS Family of products (IMS, CICS, GTF, etc.) | — | — | 30 |
| IBM | Network Performance Analyzer-Controller | — | — | 31 |
| IBM | Network Performance Analyzer-Host | — | — | 32 |
| IBM | Capacity Planning Extended (CPX) | — | — | 33 |
| IBM | SNAPSHOT | — | — | 34 |
| IBM | LOGSCAN or the Q. Command | — | — | 35 |
| IBM | MVS Resource Management Facility (RMF) | — | — | 36 |
| Institute for Software Engineering | Workload Management System | — | — | 37 |
| Johnson Systems Inc. | CICS/VS-UMAX | — | — | 38 |
| Johnson Systems Inc. | OS Job Accounting | — | — | 39 |
| McDonnell Douglas | IMS-MAPS | — | — | 40 |
| Morino Associates Inc. | MVS Integrated Control System (MICS) | — | — | 41 |
| Morino Associates Inc. | TSO/MON | — | — | 42 |
| NCR-Comten | Dynaprobe Series Hardware Monitors | — | — | 43 |
| PACE | KOMAND | — | — | 44 |
| Performance Management Associates | Cost Analyzer | — | — | 45 |
| Performance Systems | SCERT II | — | — | 46 |
| Questionics | Response Time Monitors | — | — | 47 |
| SAS Institute | Statistical Analysis System (SAS) | — | — | 48 |
| Software Corp. of America | DPRO | — | — | 49 |
| SHARE | SHARE MODS TAPE | — | — | 50 |
| Tesdata | AMS Hardware Monitoring System | — | — | 51 |
| Univ. of Toronto | THEsolver | — | — | 52 |
| Value Computing | Comput-a-charge | — | — | 53 |

Others (Please List):

| | | | |
|---|---|---|----|
| — | — | — | 54 |
| — | — | — | 55 |
| — | — | — | 56 |
| — | — | — | 57 |
| — | — | — | 58 |

This listing of the products and facilities that users in IBM MVS shops may be utilizing for performance management and capacity planning has been reproduced from Morino Associates' MVS Worldwide Performance Management & Capacity Planning Survey. It is Question 4 in the 28-question survey.

Office Videotex Offered in U.S. By UK Firm

By Brad Schultz

CW New York Bureau

NEW YORK — Is videotex DP? Attendees here at last week's Videotex '82 conference had different answers to that question, but they also had a chance to see a new office system that can deliver videotex within an organization while linked to the DP department's mainframes. Rediffusion Computers, Ltd. — a 10-year-old British company with marketing branches in the Soviet bloc, the Mideast, Ireland and the Far East — will distribute its R2800 Telecentre to U.S. users through Blodgett Computer Information Systems, Inc. of Salt Lake City.

Available in three models, the R2800 consists of a minicomputer, disk storage, tape drive and optional communications gear — all packed within a chassis about the size of a filing cabinet.

"Any Telecentre can communicate with any other Telecentre and with most other computer-based communications systems," a spokesman said. "Rediffusion Computers' idea of an office is different," he noted. "The concept of the four-wall office is rejected."

According to him, up to 64 workers, equipped with Rediffusion workstations called Teleputers, can access a Telecentre from wherever they are — at home, for example. Some companies might have their DP departments develop videotex services (online information utilities) that are distributed through Telecentres to end users or to company affiliates and customers, the president of Blodgett Computer said.

Basic Mission

The Telecentre's basic mission is translating the contents of data bases into videotex frames, another spokesman explained. Rediffusion developed protocols that allow the Telecentre to exchange messages, under the ISO High-Level Data Link Control protocol, with other systems in full-duplex mode.

Telecentres may contain Rediffusion's 16-bit R3000A minicomputer, which has an 800-nsec cycle time, or the vendor's 16-bit R5000A mini, which has a 400-nsec cycle time. Both minis come with up to 1M byte of main memory, in 64K-byte increments, and Winchester 14-in. disk drives for mass storage, according to the spokesman.

Available in five models, the Teleputers come with dual floppy disk drives that can hold 500K bytes. These workstations feature 15-in. monitors and may be ordered with a pad on which the user may draw pictures that can be incorporated in videotex frames, according to the vendor spokesman.

Depending on options, the R2800 Telecentre costs between \$80,000 and \$500,000, while cost of the Teleputers ranges from \$1,800 to about \$5,000 per unit, according to the vendor spokesman.

More information on the Rediffusion products is available from Blodgett Computer, 4561 S. 2300 East, Salt Lake City, Utah 84117.

American Bell to Market It

AT&T Unveils Frame Creation Terminal

By Brad Schultz

CW New York Bureau

NEW YORK — AT&T colors — more than 65,000 of them — were mounted firmly in the on-line information services arena last week with the introduction of a synchronous full-duplex terminal designed by Bell Laboratories, built by Western Electric Co. and slated for marketing by the new American Bell, Inc.

Shown here at the Videotex '82 conference, just a few blocks from the site where AT&T's future headquarters is being constructed, the Frame Creation Terminal allows the user to draw pictures on a graphics tablet and have the pictures, plus contents of a remote data base, displayed on a 13-in. monitor in more than 65,000 blends of 16 basic colors.

This terminal and Advanced Information Systems/Net 1 (known until two weeks ago as the Advanced Communications Service) are the initial offerings of American Bell, which begins operating this week as an unregulated AT&T subsidiary that may not be subsidized by customers of the Bell system [CW, June 21].

Terminal Users

AT&T spokesmen emphasized that the Frame Creation Terminal can be used by people who lack significant training or interest in computer technology. The terminal "is a production tool for creating, formatting, editing and interframe linking of videotex information frames," one spokesman explained.

"It is designed with the needs of videotex information and data base providers in mind," he said. Current and projected suppliers of videotex — the popular term for a class of on-line information services mostly aimed at the broad public — include a number of publishing and broadcasting companies.

The Frame Creation Terminal features two 8-in. disk drives for local

mass storage and a keyboard with the standard typewriter layout, as well as 22 keys for color control and character set selection and another 12 keys

protocols at speeds ranging from 1,200 to 9,600 bit/sec. It reportedly can be used to edit frames originally composed on other PLP-compatible terminals.

The product was developed during the past two and a half years, another spokesman stated, adding that its first customer — Viewdata Corp. of America — is scheduled to receive 25 units later this summer. "Controlled introduction" will proceed through the rest of 1982, he noted, and regular marketing will begin in January.

The Frame Creation Terminal costs about \$34,000 from the firm at 4 Wood Hollow Road, Parsippany, N.J. 07054.

CW at Videotex '82

to control text and cursor movement.

Driven by a 16-bit microprocessor and compatible with the Bell 212A modem, the Frame Creation Terminal conforms to AT&T's Presentation Level Protocol (PLP) and the X.25 and High-Level Data Link Control

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Managers on the Move

CAROLYN FESSLER has been named information services manager of *The Dallas Morning News*. She is responsible for the planning, development and management of opportunities available to the newspaper in the telecommunications and information services fields.

Fessler was formerly the *Morning News* cable news producer. Before joining the company, she was the 6 o'clock news producer, reporter and arts critic for KVOA-TV in Tucson. Before that she produced the 5 o'clock news at KDFW-TV in Dallas.

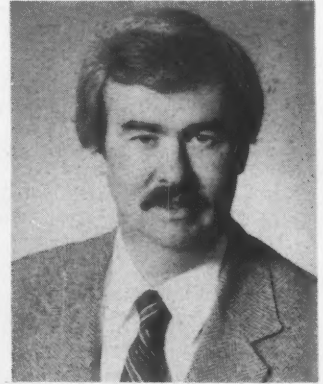
Fessler holds B.A. degrees in journalism and German from Michigan State University.



Carolyn Fessler



Charles Haywood



Clifford Hall

...

CHARLES A. HAYWOOD has been promoted to manager of information services at Anheuser-Busch, Inc. in St. Louis. He will be responsible for user-directed data processing and office automation activities.

Haywood began with the company as a computer programmer, served as a corporate planner and most recently held the position of manager of personalized computing.

He earned a B.A. degree in mathematics and chemistry from Southeast Missouri State University and an MBA from the University of Missouri at St. Louis.

...

CLIFFORD R. HALL has been promoted to director of information management at GTE Automatic Electric, Inc. headquarters based in Northlake, Ill. He is responsible for the systems and data processing organizations along with other central administrative functions.

Hall, formerly data center director at the company's headquarters, began his career as a systems analyst. Before joining GTE, he had been employed by the Boeing Co. and Pacific Northwest Bell.

He graduated from the University of Washington, Seattle, with a B.A. degree in business administration.

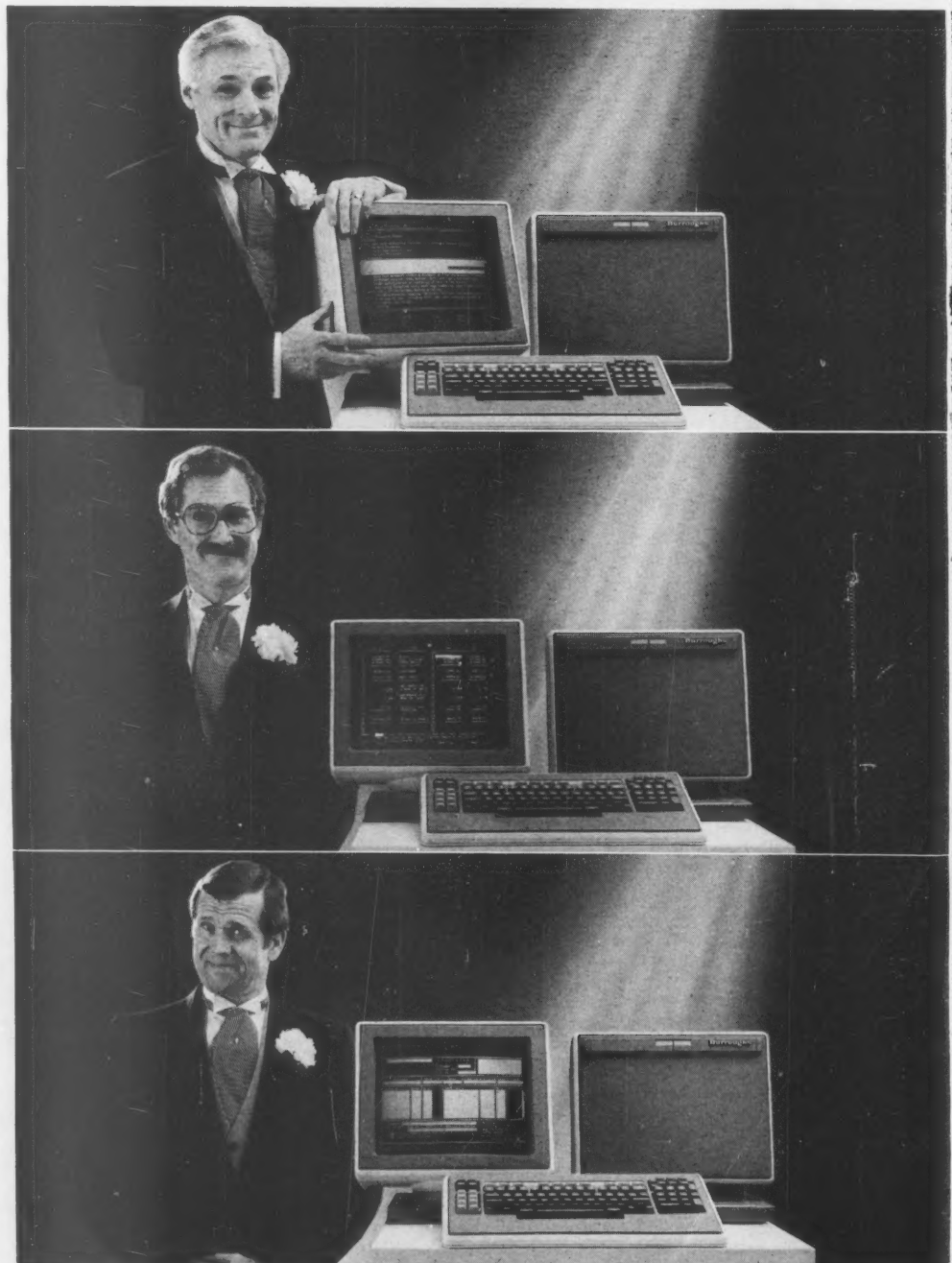
...

ROBERT M. NEWBURG has been promoted to manager of systems and programming at the *New York Daily News*. He will be responsible for the development of all new commercial systems at the *News*.

Newburg joined the paper as systems manager in charge of display and classified advertising and production systems. Prior to that he was a data processing consultant, developing classified software, and a senior project analyst responsible for financial and labor distribution applications for Abex Corp. He began his career as a programmer for Workman's Benefit Fund and has served in various systems and management capacities for Russ Togs, Goldman Sachs, C.G.A. Consulting and the city of New York.

He received his B.A. degree in economics and computer science from the City College of New York.

(Continued on Page 13)



Managers on the Move



Robert M. Newburg

(Continued from Page 12)

WILLIAM L. HORROCKS has been named director of medical center information systems at the Milton S. Hershey Medical Center of Penn State University. In this position he is responsible for planning, coordinating and control of the Medical Center's information systems, which include the operation of the computer center.

Before joining the Medical Center as director of the computer center, Horrocks was employed as the director of information and systems development with Philadelphia Health Management Corp. He also has held positions in data processing management and systems development with the National Liberty Corp. and Blue

Cross and Blue Shield of Delaware, Inc.

Horrocks earned his B.S. degree from Ursinus College.

...

JOSEPH J. GROELLY has been promoted to coordinator of retail systems development and support in the Communications and Information Services Division of Wakefern Food Corp. in Elizabeth, N.J. He will be responsible for the development and support of all retail electronic systems.

Groelly joined the company in 1970 as a systems analyst and has held various positions in the Communication and Information Services Division.

He holds a B.A. degree in industrial engineering from Newark College of Engineering.

...

LAWRENCE B. FREED has been promoted to director of data processing for Beneficial Computer Services, Inc., a subsidiary of Beneficial Standard Corp. in Los Angeles. In this capacity, he will direct data processing activities for the parent corporation, subsidiaries and outside clients.

Prior to his recent promotion, Freed was manager of production control and was later promoted to director of the data center.

He received a B.A. degree in communications from New York Institute of Technology. He is a member of the Data Processing Management Association.

...

PATRICK MCGUIRE has been appointed director of management information systems at Grantree Furniture Corp. in Portland, Ore. He will be responsible for managing the company's data processing and systems development activities.

Prior to joining the company, McGuire served as director of information systems for Kaiser-Permanente Medical Care organization.

He holds a B.S. degree from Portland State University.

...

ARCH MACISAAC has been appointed director of management information systems at Ocean Spray Cranberries, Inc. in New York. In this new position, he will direct the cooperative's recently expanded computer operations, including its logistics management system, which provides access to sales, inventory and production information.

Prior to joining the company, MacIsaac was director of consulting services at the American Hospital Supply Corp. where he was involved in the design and implementation of a number of logistic management systems.

He received an M.S. and MBA from Lake Forest College Management School.

...

FRANK PERETO has been named manager of manufacturing and marketing systems development at Ocean Spray Cranberries, Inc. in New York. In this newly created position, he is responsible for the planning, design, installation and personnel interaction for computer systems associated with the cooperative's manufacturing and marketing divisions. Pereto also holds responsibility for the company's logistic management system.

Prior to joining Ocean Spray, Pereto was an independent data processing consultant for several Boston-area companies, including Digital Equipment Corp. and Telephone Management Systems. He previously held senior information systems positions at the Advent Corp. and the National Grange Mutual Insurance Co.

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Multiplan is a trademark of Microsoft Inc.

Burroughs

Building on strength

Show Hailed Success Despite Few Debuts

By Bob Johnson

CW New York Bureau

ATLANTIC CITY, N.J. — Despite few announcements of new products and a brief power outage that affected some exhibits, Comdex/Spring '82 was hailed as a success by conference management and attendees alike.

CW At Comdex

ence management and attendees alike.

By the end of the second day of the semiannual computer dealer show, Comdex officials said that nearly 16,000 people, including exhibitors and attendees, had registered.

Peter Young, spokesman for the show's sponsor, the Interface Group, described the June show as "hot." He said that the show had met its goal of targeting itself primarily at retailers and system integrators as well as OEMs and independent sales organizations.

"The computer industry marketing flavor is very good here in Atlantic City. We are getting a higher quality of people attending the show than we did last year in New York City," he said. He added that this show in its second year had more exhibitors than the Las Vegas Comdex had in its second year.

Young noted that Comdex/Spring had 50 to 100 new companies, most of which were never heard of before. He claimed that this is indicative of a "radically new world computer industry" serving the high-volume needs of computer manufacturers that require more avenues of distribution.

'Low-Key' Atmosphere

Comdex attendees, apparently pleased with the show, noted that the atmosphere was "low key" and very professional. Wendy Germain, a marketing and communications manager at Lotus Development Co. of Cambridge, Mass., said that the people at the show were "much more industry-qualified than people who normally attend computer shows." End-user shows typically emphasize "hype" to appeal to kids and "techy types," Germain said, but "Comdex is more professional. I only noticed one exhibit that displayed computer games."

Agreeing with Germain was Marvin S. Berger, a computer and management engineering consultant at Adelphi Co. in New Hampshire. Berger said that the show exhibited "an air of maturity" about the micro-computer industry. Berger maintained that there is an evolution rather than a revolution in the industry.

"In the past the computer industry was driven by technology. Now it is being driven by marketing," he said.

Attendees felt the reason so few products were introduced at Comdex was either that they had been introduced at the National Computer Conference earlier in June or that companies were waiting for the bigger Fall/Comdex in Las Vegas.

NEC Introduces Low-End Mini for Astra Line

ATLANTIC CITY, N.J. — Among the product introductions made at Spring/Comdex '82 here last week of interest to end users was a low-end addition to the Astra series of business systems by NEC Information Systems, Inc.

The Astra 200 minicomputer is said to be upwardly compatible with the larger multiterminal systems in the Astra line. A 256K-byte system with a 12-in. display, two 8-in. double-sided dual-density diskettes offering 2M bytes of formatted storage capacity and NEC's Ilos operating system costs \$4,500.

The system can expand to increments of 128K or 256K bytes, according to a spokesman for NEC,

which is based at 5 Militia Drive, Lexington, Mass. 02173.

Another Comdex introduction was a personal computer reportedly compatible with the IBM Personal Computer. Called the Hyperion, the machine is manufactured by a Canadian company, Dynalogic Info-Tech Corp. Dynalogic said that its product, aimed at the business executive, offers a 256K-byte random-access memory and twice the diskette storage of the IBM Personal Computer.

The Hyperion costs \$4,500. Dynalogic is headquartered at 141 Bentley Ave., Ottawa, Ont. K2E6T7, Canada.

Corvus Systems, Inc. introduced the Omninet interface transporter,

which allows the IBM Personal Computer to link up with the company's Omninet communications network.

The interface costs about \$500. Corvus is based at 2029 O'Toole Ave., San Jose, Calif. 95131.

Convergent Technologies, Inc. introduced a new member of its line of multifunction workstations. The Dual-Processor Graphics Workstation supports three levels of graphics software for use by OEMs and end users, the company said.

Typical configurations range in price from \$8,350 to \$12,350. Convergent Technologies is at 2500 Augustine Drive, Santa Clara, Calif. 95051.

What if you could Zenith quality for





The Comdex/Spring '82 Exhibit Floor

CW Photo by B. Johnson

End-User Influence Evident On Comdex Meet Floor

By Bob Johnson

CW New York Bureau

ATLANTIC CITY, N.J. — End-user influence was evident on the floor of Comdex/Spring '82 here last week.

Vendors surveyed at the show — traditionally for OEMs, computer dealers and independent sales organizations (ISO) — revealed that there is a definite trend in the computer-selling marketplace toward more technical sophistication on the part of dealers and more concern about user satisfaction.

Two factors explain the trend, according to exhibitors on the floor. One is the amount of computer savvy that today's customers (end users)

possess; the other is the proliferation of personal computers, which makes the computer available to everyone.

CW At Comdex

Comdex is getting "more and more serious about what systems can do," said George T. Sebestyen, vice-president of marketing for Vector Graphic, Inc. Vector Graphic consistently received dealer inquiries at this year's show as attendees actively scrutinized manufacturers and the systems they offer.

"The dealer today is looking at things such as system tools and additions to systems such as soft keyboards and memory map screens," Sebestyen said.

End users' demands for more technical information and value for their dollar has forced the computer dealer or OEM to stay on top of the latest advances. "Dealers are getting choosy. The end user wants more, and so does the OEM. We are even seeing more dealer inquiries for value-added systems," Sebestyen observed.

Need for Sophistication

Olivetti Corp.'s vice-president of computer systems, Arthur Oppenberg, noted that the dealer sees the impact on the end user of constant information about the computer industry and realizes there are greater financial rewards to be gained. The dealer thus makes it its business to become more sophisticated about the technology.

Oppenberg offered a hypothetical situation in which a dealer calls on a large national account: "The dealer may be interfacing with a corporate DPer who really knows the technology and is responsible for buying two or three specific products. The dealer has got to look intelligent. He may have a multiple sale riding on his ability to answer the right questions."

Another exhibitor who received more sophisticated inquiries from show attendees this year was Bruce Baumann, a branch sales manager for Texas Instruments, Inc. Baumann said that in the past, dealers and OEMs were mainly concerned with simply selling a retail product; now, however, dealers are selling "more system solutions."

"The ISOs and end users both are more knowledgeable, and they want to know not only about software but system software — and not only about hardware expandability but system expandability," Baumann said.

Also observing concern at Comdex for the end user was Greg Fallon, Data General Corp.'s retail sales manager. Fallon commented that it is impossible for the dealer today to be "all things to all users," and in that respect he said ISOs are not only concentrating on technical enhancements but also specific business areas in order to meet their customers' business needs.

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Explains 'Interaction Theory' Professor Fingers Reason for User Resistance

By Brad Schultz

CW New York Bureau
CAMBRIDGE, Mass. — Does user resistance to information systems result from traits of the resisters, traits of the system or interaction between the system and its organizational context?

An MIT Sloan School of Management professor told a recent seminar here that the "interaction theory," which blames user resistance on interaction between systems and their organizational contexts, seems more accurate than the two other leading theories.

Dr. M. Lynne Markus based her assertion on a study she conducted of resistance to a financial information system (FIS) at "a major chemical and energy products manufacturing concern" with annual sales topping \$3 billion. The FIS became operational at the "Golden Triangle Corporation" [fictitious name] in January 1975, Markus said, following four years of planning, development and implementation.

Theories of user resistance are important to DP professionals because they guide strategy and tactics in the design and implementation of information systems, she pointed out.

Assumes Rational Purposes

The theory that blames resistance on "factors internal to people and groups" assumes that the purposes of information systems are rational and that people who resist such systems are irrational. This theory implies that resistance can be removed by persuading, educating or coercing resisters.

The theory that blames resistance to information systems on the systems themselves also assumes that the purposes of information systems are rational, but views the resistance as rational behavior. This theory implies that resistance can be removed by technical refinements of the systems, Markus explained.

In contrast, the interaction theory

of resistance assumes that the purposes of information systems are nonrational or political, Dr. Markus said, and implies that resistance reflects a conflict between those purposes and the objectives of the organization.

The FIS at Golden Triangle was implemented while the company underwent substantial reorganization, Markus noted. The system's basic design was influenced by suggestions from a particular set of users in the early 1970s. But other sets of users eventually had to deal with the repercussions of its implementation.

User resistance usually manifests itself as a slump in utilization of a system or a trend of people avoiding contact with one, but may be so intense as to entail acts of sabotage, Markus observed. Resistance to the FIS at Golden Triangle varied in nature and reflected the fact that its impacts on corporate-level accountants were different from impacts on division-level accountants.

In planning and designing systems, DP professionals should heed the interaction theory by trying to anticipate how the organizational context of a projected system may change in time, Markus recommended. This context may be affected by factors external to the organization, such as economic conditions, and could be substantially altered by mergers and acquisitions.

Comten Users' Exchange Scheduled for September

OAKLAND, Calif. — The Comten Users' Exchange will hold its 19th international conference here Sept. 27 to Oct. 1. The meeting, sponsored by NCR Comten, Inc., will focus on network distribution and transmission technologies for both local and long-haul environments.

Guest speakers will include Dr. Leonard Kleinrock of the University of California at Los Angeles and representatives from ITT Europe. Sessions will cover such topics as emula-

tion processing, network control and networking.

Presentations will be given by users and NCR Comten on X.25 packet-switched network implementations, configuration and capacity planning and the status and future of current standards efforts.

Attendance costs \$175 for the full week; \$75 for one-day registration. Further details can be obtained from NCR Comten, Inc. at 2700 Snelling Ave. N., St. Paul, Minn. 55113.



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■ Special Interest group meetings on technical issues of your choice.

■ Vendors will exhibit the latest products designed to improve security and productivity in the auditing field.

■ Keynote and technical session speakers will address industry philosophy toward security, control, and audit in the newest generations of software and hardware products for IBM systems.

■ Plan to register early (1981 Conference was sold out) for this unique conference, featuring a roster of nationally known speakers from IBM and from industry, on September 13-16, 1982 in Boston, Massachusetts.



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What Is the Best Training Method?

Q For the past year and a half I have been assigned part time as a training coordinator. With almost no budget, there is little flexibility in what can be made available to our 65 professional people.

I was just appointed training coordinator full time and was asked to submit a plan for training and budget requirements. Which training methods have other companies found to be successful?

A There is no one, two or even three best approaches to information services education. The most effective education programs take advantage of all available sources of education.

It is your responsibility to recommend and direct personnel to the most cost-effective alternative for each educational need. "Cost-effective" does not translate into "cheapest." The following overview may help you to select an optimal mix of educational delivery systems:

- **On-the-job training.** This is a viable method of education if, and only if, a well-documented set of learning objectives exists and a certain amount of time is set aside for the individual to pursue these objectives.

- **Independent study.** The opportunity for independent study can be provided if an up-to-date library of books and periodicals is maintained. This is probably the most cost-effective approach for most circumstances.

- **Seminars.** If someone develops an expertise that you think could be of value to others, ask him to present an in-house seminar. A department your size should have such a program every couple of months. Occasionally invite an outside specialist to lecture on a timely topic. An abundance of commercial seminars is available in both public and in-house formats. Many of these are excellent, but some are all marketing and no content; part of your job is to identify the good ones and bad ones.

- **Video-based and computer-aided education.** The efficiency of the transfer of knowledge in self-paced education courses is a matter of debate. Even so, this relatively inexpensive approach to education should be part of your repertoire because of the range of topics available.

- **University courses.** Seek out appropriate programs in neighboring colleges and encourage people to attend.

- **Conferences.** Every professional should attend at least one conference per year.

Q I have a B.S. in mathematics and have worked as an analyst/programmer for eight years. I have been trying in vain to immigrate to the U.S. for the past three years.

I sent my resume to a few U.S. companies and got replies stating that unless I had a green card I could not be considered. When I applied to the local American Embassy expressing my desire to immigrate, they insisted on a Department of Labor Certification that I have a job. Is there anyway to resolve this "Catch-22" situation?

A This classic example of "Catch-22" has affected thousands in similar circumstances. There is no clean resolution to this conflict in corporate and federal policy.

I would not recommend it unless you have a sincere interest in the pursuit of graduate work, but some people have elected to obtain a student visa and attend graduate school. An experienced graduate available for on-site interviews has a much higher probability of obtaining the exclusive certificate.

Q I recently received a bachelor's degree in management information systems and am currently working as a Cobol pro-

grammer. I enjoy working with computers but would prefer to work more with people.

I would like to work as some type of consultant. What type of experience/education do I need? I have been told that I would get better experience through sales than systems analysis.

A A good consultant has a wide range of experiences and exposure to a variety of situations. I can think of only one other position that would top a systems analyst for both experience and exposure. That position is a consultant.

However, very few consulting firms hire rookies. Get three or four

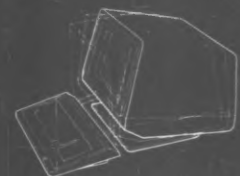
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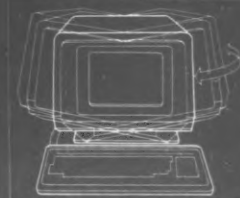
years of experience and perhaps a master's degree, then seek a position as a consultant.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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FEATURE COMPARISON CHART

| FEATURE | VISUAL 50 | Hazeltine Esprit | ADDS Viewpoint | Lear Siegler ADM-3A | Teletype 510 |
|------------------------------|-----------|------------------|----------------|---------------------|--------------|
| Tilt and Swivel | YES | NO | NO | NO | NO |
| Detached Keyboard | YES | NO | YES | NO | NO |
| N-Key Rollover | YES | NO | YES | NO | NO |
| Available Key Click | YES | YES | NO | NO | NO |
| Menu Set-Up Mode | YES | NO | NO | NO | NO |
| Status Line | YES | NO | NO | NO | NO |
| Full 5 Attribute Selection | YES | NO | NO | NO | YES |
| Smooth Scroll | YES | NO | NO | NO | NO |
| Low Drawing Character Set | YES | NO | NO | NO | NO |
| Block Mode | YES | YES | NO | NO | YES |
| Insert/Delete Line | YES | YES | NO | NO | YES |
| Bi-Directional Aux Port | YES | YES | NO | YES | NO |
| Continuous Tabbing | YES | YES | NO | NO | YES |
| Independent RLV/TK Rates | YES | NO | NO | NO | NO |
| Answerback User Programmable | YES | NO | NO | OPT | NO |

July 26-29, Los Angeles — **Vtam: From Start to Finish.** Contact: On-Line Software International, 65 Rt. 4 E., River Edge, N.J. 07661.

July 26-29, Los Angeles — **Programming in Ada.** Contact: Computing Trends, 6925 56th Ave. S., Seattle, Wash. 98118.

July 26-30, Summit, N.J. — **CICS Command-Level Programming.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

July 26-30, Washington, D.C. — **Microprocessors and Microcomputers: Theory and Applications.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

July 26-30, Boston — **Structured Analysis Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

July 26-30, Boston — **System 1022**

Data Base Management System Training Seminar. Contact: Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

July 26-30, Summit, N.J. — **CICS Command-Level Programming.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

July 27-28, Valley Forge, Pa. — **Developing & Managing the Disaster Recovery Project.** Contact: Devlin Associates, Inc., Suite 795, 1150 First Ave., King of Prussia, Pa. 19406.

July 27-29, San Francisco — **SAS Computer Performance Evaluation Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

July 28-29, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Insti-

tute, Inc., P.O. Box 8000, Cary, N.C. 27511.

July 28-30, Rochester, N.Y. — **Data Communications Systems, A Practical Guide.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

July 28-30, San Diego — **Local-Area Network.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

July 28-30, San Francisco — **Information Resources Management.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

July 28-30, Washington, D.C. — **Financial Information Systems: The**

New Generation. Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

July 29, Washington, D.C. — **How to Add Graphics to Current Hardware and Software Offerings.** Contact: Carole Ann Jones, 600 Maryland Ave. S.W., Washington, D.C. 20024.

July 29-30, Valley Forge, Pa. — **Advanced Disaster Recovery Planning.** Contact: Devlin Associates, Inc., Suite 795, 1150 First Ave., King of Prussia, Pa. 19406.

Aug. 2-3, Washington, D.C. — **Data Dictionary Systems: Evaluation and Selection.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-3, Dallas — **Computer Terminals Selection: Guidelines for Meeting Productivity Goals.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-3, San Francisco — **Word Processing Implementation.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

Aug. 2-3, Anaheim, Calif. — **Structured Methodology.** Contact: Education Foundation of the Data Processing Management Association, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Aug. 2-4, New York — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-4, Summit, N.J. — **IMS Data Base Access DL/1.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Aug. 2-4, Palo Alto, Calif. — **Cryptography and Data Security.** Contact: Hellman Associates, Inc., 299 S. Calif. Ave., Palo Alto, Calif. 94306.

Aug. 2-4, Washington, D.C. — **Integration of Word Processing and DP Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-4, Los Angeles — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-4, Denver — **Telecommunications Management: Cost Reduction Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 5-6, Newton, Mass. — **Data Processing Fundamentals for Accounting and Financial Managers.** Contact: Professional Development Seminars, Boston University Metropolitan College, 755 Commonwealth Ave., Boston, Mass. 02215.

Calendar

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OAC is seeking participants for its conference. The theme for the fourth annual conference is "Explorations in Office Automation," and participation is solicited in each of the following programs: advanced office technology, communications, current office technology/systems, human factors and social issues and systems integration.

Persons who wish to be speakers or session leaders are encouraged to submit their proposals by July 15 to INA Corp., 5th Floor, 1600 Arch St., Philadelphia, Pa. 19101.



WELLS FARGO & CO.

IN DEPTH LESSONS FROM WELLS FARGO

BY JAY BLOOMBECKER

With the sentencing last month of Harold Smith to 10 years in prison for his role in the \$21.3 million theft from the Wells Fargo Bank [CW, June 21], the story of one of the biggest bank embezzlements in history comes to a close. From the National Center for Computer Crime Data's review of the evidence and testimony, the author has compiled a summary of what happened, how and why it happened, and lessons that banks and other computer users can learn from the case.

Early in 1976, Harold Rossfields Smith tried to cash a check. A recent arrival in the rich and showy Marina del Rey area of Los Angeles, he tried the Marina branch of the Wells Fargo Bank. He spoke with Sammie Marshall, a young, up-and-coming banking and services officer. At trial, Marshall recalled:

"He . . . had been in track and field himself in college. And he had been a part of the civil rights movement throughout. And he had worked with [Muhammed] Ali and become friends with Ali . . . One of his goals was to put together a track team for underprivileged kids . . . academically not qualified to be admitted . . . to various colleges around the United States. So he wanted to gather the kids and put them in one situation where they could compete on a national and international level."

Smith explained that he needed to cash an out-of-state check

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If you need to talk to computers... or if your computers need to talk to far-flung terminals... or any combination of these—you should talk to GTE Telenet.

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IN DEPTH

to attend a track meet in New York. Marshall said no.

About two weeks later, Smith returned to the bank, accompanied by track star Houston McTear. Again he wanted a check cashed, and

again Marshall said no.

But they kept talking. Smith told Marshall that Muhammed Ali had taken an interest in McTear because of his poverty. The runner's father, felled by a stroke, lived

with eight children in a two-room house. Smith was in the process of getting McTear a tutor so that he could enroll in junior college. As they spoke more, Marshall's attitude changed.

"I just felt good — had good vibes about him," Marshall testified.

Marshall's business decision changed too. Smith got the money.

Smith (as his attorney was

to argue to the jury much later) "was a man with a dream." The track team he was putting together was to be no penny-ante pick-up squad scratching in the dirt, pretending they were somebodies. It bore the name of Muhammed Ali, as did several of Smith's enterprises. Having bought the right to use the name, Smith ran Muhammed Ali Amateur Sports, Inc. and Muhammed Ali Professional Sports, Inc.

The amateur sport group sought out and found a number of the nation's best amateur boxers, offering television, training and a taste of celebrity — maybe even a sparring session with "The Greatest" himself. Smith planned to become the dominant force in professional boxing. The amateurs would win, bring home medals and publicity from the 1980 Olympics and establish a dynasty to last for quite some time.

But you need a bankroll if you want to run a business that can become "The Greatest." When you use the name Muhammed Ali and you "want to dominate the business of promoting boxing matches and other sporting events in the United States," you can't go around acting like a pauper. Airplanes, a yacht, numerous other goods and services, a trip to Australia with 40 people in the entourage and \$400,000 worth of bills unpaid — that's what it takes to make an impression in these inflation-ridden times.

So it was important for Smith to bank where he was well liked. Marshall filled the bill. After Marshall's help with the out-of-state check, Smith began to bank with him.

In late 1976, Marshall transferred to the Beverly Drive office of the Wells Fargo Bank "in order to further my career." He started handling more sophisticated loans involving real estate and commerce. When he transferred to Beverly Drive, Marshall resumed his friendship with Ben Lewis, the operations manager there. Marshall and Lewis spent a good deal of time together, going to lunch almost every day, playing on the Wells Fargo basketball team and watching football at Marshall's house.

In October 1977, Smith opened an account at Beverly Drive. Marshall took the occasion to introduce him to Lewis. Lewis apparently was

SCIENCE/SCOPE

Intelsat VI communications satellites can be flown on either the Ariane 4 or the Space Shuttle. For an Ariane launch, the spacecraft is mated to the booster with a conical adaptor and clamp. A Shuttle launch requires additional hardware — including a cradle to hold the spacecraft in the Shuttle bay and a perigee propulsion stage to inject the spacecraft into synchronous orbit. The compact launch arrangement provides maximum payload capacity on Ariane 4. A Shuttle launch is also economical because of the satellite's length-to-weight ratio. Its overall length in the Shuttle is only 44.6% of the orbiter bay; its weight uses 45.4% of available capacity. Hughes heads an international team building Intelsat VI for the International Telecommunications Satellite Organization.

A research vessel crewman may owe his eyesight to the oldest, continually-operating communications satellite. The man was helping conduct climate tests in the Pacific Ocean last year when one eye became infected. (He previously had surgery on the eye after fragments from an exploding light bulb injured it.) The man's doctor in Seattle was contacted via radio to prescribe care, but the infection worsened and radio contact was lost. The ship's medical technician turned to NASA's ATS-1 satellite to arrange an evacuation. When the ship docked at the Galapagos Islands, a waiting plane flew the crewman to Panama for treatment that may have saved his sight. The Hughes-built ATS-1, though expected to serve just three years, recently celebrated its 15th year in orbit.

Transistorized series-resonant-inverter (SRI) technology has been advanced to a resonant operating frequency of 200 kHz in another step toward minimizing inverter size and weight for spaceborne power-conditioning applications. The new Hughes SRI design uses power field effect transistors, which permit higher switching speeds. The design allows use of smaller inductors and capacitors, resulting in faster response to transient load changes and input-voltage variation. The SRI could be used as a beam power supply of an auxiliary propulsion ion thruster, or as a power conditioner for a high-power traveling-wave tube.

A new eraser/simulator/programmer supports existing EEPROMs from Hughes, plus additional planned memories. The microprocessor-controlled smart programmer is designated H0000 ESP. It can erase, program, read, copy simulate, modify, and compare a variety of PROMs. It requires no personality boards, hardware changes, or switch settings for different memory and parameter selections.

Hughes is seeking engineers to develop advanced systems and components for many different weather and communications satellites, plus the Galileo Jupiter Probe. Immediate openings exist in applications software development, data processing, digital subsystems test, microwave/RF circuit design, power supply design, digital communications, signal processing, spacecraft antenna design, system integration test and evaluation, and TELCO interconnection. Send your resume to Tom W. Royston, Hughes Space & Communications Group, Dept. SE, Bldg. S/41, M.S. A300, P.O. Box 92919, Los Angeles, CA 90009. Equal opportunity employer.

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LESSONS FROM WELLS FARGO

IN DEPTH

impressed; he was later to testify that he had known of Smith through newspaper articles.

In July 1978, Lewis took a honeymoon tour. It was a bargain trip, two tickets for the price of one, provided through Tommy Bole's travel agency. Smith had arranged it with Bole. Lewis had told Marshall that he wanted to take a honeymoon trip and Marshall had told Smith.

As Lewis was visiting London, Paris and Amsterdam, Smith was having trouble keeping his accounts out of the red. Marshall was patient with Smith's frequent overdrafts, but the company's finances didn't improve. Soon after Lewis returned from his honeymoon, Smith's finances grew worse. First Lewis had cashed a \$3,000 check from Bole for Smith, then a \$5,800 check from Mitre Corp.

Wells Fargo could not collect on either of these checks, and bank procedures called for Smith's account to be charged with them, debited \$8,800. Lewis sent the checks to Marshall, but Marshall knew there wasn't enough money in Smith's account to cover them. He called Lewis and asked him to give his friend Smith a bit more time to cover the checks. "Harold is good for it," he promised.

Soon Lewis got a call from Mr. Two-for-One Honeymoon himself.

"I need a favor," Smith said. He wanted Lewis to hold on to the checks for a little while. Lewis agreed.

Jaunt to New Orleans

Not much later, Smith called again. He asked if Lewis (a man who lived, ate and breathed boxing, according to his boss, Brian Feeley) would like to go see the Muhammed Ali vs. Leon Spinks fight in New Orleans. (Fans will no doubt remember this return engagement which allowed Ali to regain his crown for an unprecedented third time.) Smith promised Lewis plane fare, tickets to the fight, hotel reservations and a Muhammed Ali warm-up suit.

So, on Sept. 14, 1978, Lewis joined the party and flew to New Orleans. He carried along a robe for Ali that a friend had sent from Florida. Smith brought Lewis to Ali's room to meet the champ and deliver this special gift. En route home after the fight, Smith explained how he dealt with the financial difficulties that Muhammed Ali Professional Sports faced. He told his friend Nancy Carter about his relationship to the Wells Fargo Bank, describing Marshall as "his banker." Smith said that Marshall might come to work for him at Muhammed Ali Amateur Sports, but at this time it was more advantageous to keep him in his place at the bank. Smith also explained that the Wells Fargo Bank was holding his overdrafts for him.

Back in Los Angeles after the fight, Lewis still had some bouncing checks to deal with. The Bole and the Mitre checks had been on his desk for almost two weeks. He sent them

back to Marshall. But on Oct. 11, Marshall sent them back to Lewis. While the two were playing ping pong with the checks, Marshall decided to take a leave of absence from the bank and go to work for Smith.

In late 1977, Smith had offered Marshall a job in Muhammed Ali Professional Sports. Marshall had turned it down, because he knew nothing about boxing, nothing about track and field and nothing about negotiating TV contracts. But Marshall

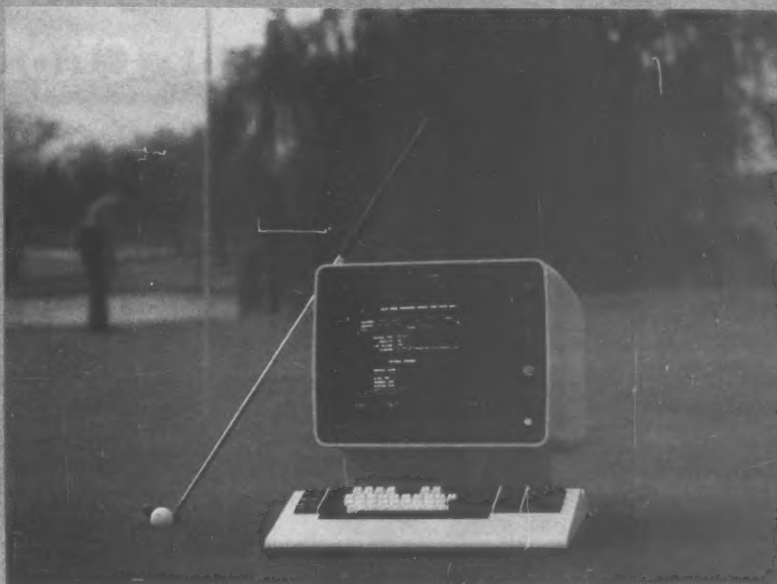
changed his mind after Gene Kawakami, his supervisor at Wells Fargo, told Marshall that he didn't want Marshall in the office. (Kawakami was to plead guilty to embezzlement in another case concerning Smith's accounts.)

Critical Juncture

Now, at what the prosecution called a critical juncture of the case, Marshall and Lewis engaged in an important phone conversation. Be-

fore Marshall left, there had been two matters for his attention. On Oct. 4, he had issued a \$19,000 cashier's check to Tel-Star for Smith, without receiving any funds. Though he was supposed to send a copy of the check through bank channels for processing, he held that copy until the 16th of the month. At that time, he sent both the checks and the debit half of a branch settlement form through the branch settlement system.

At the same time, he sent the credit



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IN DEPTH

half of the same branch settlement form to Lewis. Lewis was as confused as the reader may be. He asked Marshall what he was supposed to do with the credit half of the bank settlement form that

Marshall had sent him. Marshall said he was doing Smith a favor and didn't have time to clear it up. He wanted to know if Lewis would take care of it for him. Lewis agreed.

At trial Lewis testified: "I had no account to debit or anything. I asked Sam how I was supposed to clear this. He told me I could just roll it over and code one half of the branch settlement [form]

with the account number at Miracle Mile, which he gave me in that conversation, and that it would go through."

Lewis questioned whether this would work since "it wasn't the right way to do

it." Marshall said it would go through okay. (For a detailed explanation of how this all worked, see the excerpts from the opening argument of the prosecutor, Assistant U.S. Attorney Dean B. Allison, on Page 26.)

The trial transcript sheds no light on what went through Lewis' mind as Marshall told him about the rollover method. Within a couple of weeks, though, \$47,000 worth of transfers were made using this ploy.

"It started out with Sammie Marshall being a friend of mine, and he introduced me to Harold Smith," Lewis testified at trial. "And I trusted Sammie Marshall, and I saw no reason not to trust Harold when Sammie verified the fact that Harold always made things good."

In addition, he liked Smith's youth amateur program, he was very fond of Muhammed Ali and "at this point, I was so deep into it, I couldn't get out anyway."

Scheme Snowballs

Once started, Lewis was consistent. On Oct. 27, he made out a new branch settlement ticket. He offset the credit ticket he had received from Marshall with a new debit ticket and he held the new credit ticket under the blotter on his desk. Ten days later he offset the credit with a new debit and put its corresponding credit under the blotter. He kept scrupulous account of how much he took, clinging to the hope that Smith would strike it rich and pay off his debt to the Wells Fargo Bank. Every few weeks he would talk to Smith about how much the debt was, and Smith would always assure him that it was no problem, that the money would be coming.

Smith held out each upcoming event as the one that would turn the tide. January 1979 was a banner month. The Muhammed Ali Invitational Track Meet and a Marvin Gaye concert were supposed to produce enough funds to take care of all the debt Lewis was carrying. But the Marvin Gaye event was canceled and the track meet netted much less than planned. Lewis asked Smith where the money was, and once again Smith told him not to worry.

Not long afterward, Smith invited Lewis to join the entourage going on the "Down Under Tour" of Australia and New Zealand featuring

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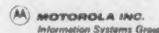
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LESSONS FROM WELLS FARGO

IN DEPTH

Ali. But by Feb. 13, 1979, the Down Under Tour was in danger. Unless Ali got \$223,000 up front, he would not go, Smith told Lewis at an urgent meeting in the Beverly Drive parking lot. No Ali, no tour.

So Lewis went into the bank and cut a check for \$223,000. This too was concealed through the same use of the branch settlement procedure.

Suddenly the stakes had grown. Up to this point, Lewis had rolled over numerous checks to keep Smith's account afloat, but none much larger than the \$19,000 cashier's check Marshall had cut to pay Tel-Star. With the payment of \$223,000 to Ali, Lewis almost doubled the amount that had been stolen from the bank since Aug. 17, when he and Marshall began bouncing the \$5,800 Mitre check between them.

Within a month of the parking lot meeting, another \$300,000 was added to the theft. By April 1979, the bank was out almost \$1 million.

Uneasy Times

For Lewis, the criminal's life was not a happy one. Any unfamiliar car in the Beverly Drive parking lot frightened him. He feared it might belong to an auditor who would discover the fraud.

Smith appeared unfazed by the growing crime. In mid-'79, Smith visited Lewis at the apartment to which Lewis had moved after separating from his wife. Smith, ever-generous with Wells Fargo's money, was paying Lewis' rent there. "Look at this," Lewis told Smith, presenting him with the running total of their theft. "Don't worry," Smith said.

Smith continued to spend. In February 1980, he purchased a jet for \$350,000. In March 1980 he told Lewis to pay \$145,000 for the house he bought from the same branch settlement system.

When asked where he got the money to finance his many fights, Smith had more answers than Ali had moves. His explanations included Middle-Eastern investors, people in the oil or gold industry, his wife's recently departed relatives and his wife's relatives (still alive in truth and in this alternate version).

On Jan. 14, 1981, the bank-roll ended. Lewis doesn't know what happened,

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NOTE: YOU MUST CONTACT BRANCH SETTLEMENT CONTROL IF IT IS NECESSARY TO ORIGINATE A REVERSAL OR REPLACEMENT B/S. THE UNUSED PORTION OF THIS B/S LETTER MUST BE ATTACHED TO THIS TRACER AND RETURNED TO THE ADDRESS BELOW

ADDRESS INQUIRIES TO: BRANCH SETTLEMENTS CONTROL, EX. 5F 5847

REPLY WITHIN THREE DAYS

TO: BRANCH SETTLEMENTS CONTROL 376
OPERATIONS CENTER
SAN FRANCISCO

() OFFICE A.U. SUBMITTED THEIR COPY ON DATE IN BATCH BATCH NO.
() OTHER:

49228
9607-392008

AUTHORIZED SIGNATURE

NOTE: BRANCH SETTLEMENT LETTERS MUST BE CLEARED UPON RECEIPT

MY DEAR BRIAN —

I GREW 4927 GRAY HAIRS, BIT MY NAILS TO THE ELBOW, WET MY PANTS TWICE, HAD 3 FANTASTIC SPELLS, TRIED (UNSUCCESSFULLY) TO SWALLOW MY TONGUE AND AM ON THE VERGE OF A NERVOUS BREAKDOWN BECAUSE I GOT THIS TRACER. I AM CURRENTLY IN ENOUGH TROUBLE WITH RE-G-I-O-N (AND OTHERS) TO LAST A LIFETIME PLUS. — THIS TYPE OF THING MAKES ME SWEAT A LOT & MY TEETH SHAKE. I WOULD APPRECIATE ANY HELP YOU CAN GIVE ME BECAUSE IF I DON'T GET THIS CLEARED QUICK GOD (WHICH WILL BE OUT TO GET ME) BRANCH SETTLEMENTS CONTROL FUNNY — NOT "EVERYONE" THINKS I'M HILARIOUS... (SCRATCH HEAD)... I JUST DON'T UNDERSTAND IT...

JUDE...

Response to the Tell-Tale Tracer

whether he forgot to send in a credit ticket, or if it got lost in the mail.

A credit Lewis sent had not been offset by a corresponding debit for 10 days. Judy MacLardie, operations manager at the Miracle Mile branch, received a "tracer" on Jan. 14 asking why the imbalance still existed. On checking, she learned that the credit actually had originated from Lewis' Beverly Drive branch and not Miracle Mile, where she worked. MacLardie called Brian Feeley, Lewis' supervisor, and shared her confusion with him. "Send me a copy of the tracer," he said. Still not aware what she had chanced upon, MacLardie accompanied the tracer with a light note (see box above for a reproduction of the original note).

When it arrived at Beverly Drive, Feeley took the tracer and the note and put them on Lewis' desk, adding a note of his own: "Ben, take a look at this when you have a chance." Shortly thereafter, Lewis called up MacLardie and asked her to make up a substitute branch settlement to clear the tracer (that is, to reverse the entry in the branch settlement system by originating another branch settlement letter). MacLardie thought this "kind of funny." She said, "okay," but did not do what Lewis had requested. Instead, she called Feeley and expressed her

fears to him. He said, "Yeah, well maybe it might be funny, and maybe it might not be."

The next week Lewis was still concerned about the tracer. He asked Feeley what was up and Feeley said nothing. Then he called MacLardie. "Have you cleared the tracer yet?" MacLardie dodged the question. She ordered copies of background documents to explain the transaction. On Jan. 23, MacLardie finally got the details. They showed quite clearly that Lewis was at fault. When MacLardie told Feeley, there was no choice but to involve higher management. Feeley called Bob Smith, the branch manager, and together they confronted Lewis.

"How could you do this — advance these funds and use Miracle Mile's office number on there?" Feeley asked Lewis. There was little Lewis could say but acknowledge that he had done it.

While Lewis was at the meeting, Lloyd Gassway from the auditing department called. Gassway suggested that he should come to meet with Lewis at the Beverly Drive branch. Lewis said that he would rather not talk there. Gassway asked, "What about meeting at Region [the regional Wells Fargo headquarters]?" Lewis rejected that suggestion as well, saying that it was too embarrassing. Finally Gass-

way suggested El Monte, where he worked. He said, "Why don't you come at one o'clock. That will give you time for lunch." Lewis agreed.

Lunch was probably a low priority to Lewis. After leaving the bank, he called Smith, repeatedly trying to warn him and make plans. Finally, he went to Smith's office. There, behind closed doors, he spoke with Smith.

Smith was quick to mobilize. He called up Terry

Kaye, his bookkeeper, and told her to retrieve all his financial records. At 1 p.m., Lewis called Gassway and told him that he was too upset to come out to El Monte just then. Gassway, seemingly the picture of total restraint and patience, said, "Okay, what about three?" Lewis agreed. At 3 p.m., Lewis called Feeley once again. Feeley encouraged him to get out to El Monte, because by not going there he was going to make him-

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IN DEPTH

How the Scheme Worked

If you had been on the jury in this case, you would have heard Prosecutor Dean Allison explain the system in his opening statement:

"The branch settlement system is basically an accounting or a bookkeeping system that the bank uses to transfer money between one branch office and another . . .

"The bank uses a bookkeeping system for this purpose because there are so many of these interbranch transfers every day that it would be physically impossible to send little messengers running back and forth with bags of money. Now, the bank used a computer located up in San Francisco to keep track of all these transfers between branches going on every day. To make one of these transfers, the bank used a standard form to put entries telling the computer what to do. A standard form was called a 'branch settlement letter' . . .

"As the first step in the scheme, Lewis, the inside man at the bank, would pay money out to the defendants, to Smith, to Marshall or to one of their companies . . . The next step, Lewis would send the debit half of a branch settlement form into the computer, just like in the normal transaction, telling the computer in effect, 'Charge the branch settlement system for this money I paid out to Smith, Marshall, Muhammed Ali Professional Sports and Muhammed Ali Amateur Sports.

"Within 10 days after sending in the first half, though, instead of sending the credit half of the ticket over to Miracle Mile as he was supposed to, Lewis would put the credit half into the computer himself, violating the . . . principle . . . that one branch is never supposed to send both halves of the ticket into the computer. To fool the computer into thinking that the credit half of the form had come from Miracle Mile, which it hadn't, Lewis misencodes the credit half. He puts Miracle Mile's special code number in magnetic numbers on the bottom of the credit half, violating the second principle I mentioned a moment ago: One branch is never supposed to use another branch's code number.

"At this point Lewis had done enough to prevent a tracer from going out because the computer had gotten both halves of the form within 10 days. And he succeeded in fooling the computer into thinking that the two different halves of the form have come in from two different branches because the debit half has Beverly Drive's code number on it and the credit half has been misencoded with Miracle Mile's number.

"But Lewis has one additional problem to solve, and that goes back to the fourth feature that I mentioned a while ago about the books being balanced . . . So far, you will see that there are two credits and only one debit. The reason you are a debit short is that there is no real money being put into the system. No customer's account is being charged to make up for the money paid out to Smith and Marshall . . .

"To supply the missing debit, Lewis takes another branch settlement ticket and he takes the debit half of this new branch settlement ticket, and at the time he sends in the credit half of the first ticket he sends in a new debit with it. So that what the computer sees up to this point is: credit, debit; credit, debit; and everything is balanced. The computer has gotten both halves of this ticket within 10 days with two different code numbers, and the computer gives Lewis another 10 days to get the credit half of the second ticket in. Now, to keep this going, all Lewis had to do was the same thing over and over again."

self look worse. Then he said, "Listen, I talked to Lloyd, and he told me that there was another \$250,000 branch settlement on Monday the 19th." Lewis replied, "No, there weren't any others."

Feeley: "Ben, he told me he researched it."

Lewis: "No, there weren't any other ones, just the ones I told you about."

Feeley: "Come on, level with me."

Lewis hemmed and hawed and then he said, "Well, yeah, maybe, maybe there was."

Feeley: "Gees, Ben, how could you forget that? It just happened Monday, you know."

Lewis: "Well, ah, I don't know."

Shortly thereafter, Gassway froze all the accounts that had been controlled by Smith. Meanwhile, Smith and Lewis checked in under false names at the hotel on the Queen Mary in Long Beach. The two considered their options, realizing that their plan had fallen apart. Lewis suggested that they tell the bank everything and ask the bank to just let them go until after the "This-Is-It" fight to see if they could make it all back.

"No way, man. They're gonna come down on us," Smith replied.

"Do you think I should run?" Lewis asked Smith.

"It's a hard life, man," said the former fugitive.

Smith suggested that Lewis go to San Diego and hide out there while Smith attempted to get false passports for himself, Lewis and Smith's wife. Lewis had his picture taken, and Bruce Barrett picked up passport applications. Then Lewis changed his mind. He turned himself in to the Federal Bureau of Investigation about Feb. 3, 1981.

Investigation and Trial

There was no shortage of evidence as to how the theft from Wells Fargo was committed. Once Gassway began unraveling the transactions, one led to another. When he called Feeley to report on the extent of the loss, Gassway said, "You'd better get a piece of paper — a very big piece of paper."

Prosecutor Allison kept his explanations to the jury as simple as possible (again, see box on Page 26). To avoid endless testimony about each document, Allison went through one set of transactions as an example for the jury. He used Federal Rule of Evidence No. 1006 which allows the creation of summaries of voluminous records.

The defense, faced with overwhelming documentary evidence of what had happened at the bank, relied on three arguments. First, there was a general denial of Lewis' testimony.

Smith's attorney, Howard Moore, challenged Lewis' credibility, arguing that he did things without Smith's knowledge or involvement and that it was Lewis' desire to live a high life that was critical in understanding the case.

A second line of attack, while less relevant to the case, is far more interesting to the computer security practitioner: the attempt on the part of the defense to point out the weaknesses in the Wells Fargo Bank security system. In the questioning of Feeley, discussed in "What Users Can Learn From the Case" (see Page 27), there is an implicit argument that the bank was so poorly run that it was unfair to blame Smith for this one of many illegalities with which the bank was involved. To say that the effort failed is to exaggerate its sophistication. Nonetheless, the facts do demonstrate a number of flaws in the Wells Fargo security and management systems.

Finally, Smith's main thrust of argument, that he had an unlimited line of credit from the Wells Fargo Bank (or that he at least believed he did) proved problematic for both prosecution and defense.

Prosecutor Allison had the task of proving a negative, that Smith never had a line of credit. This disproof is never easy. Allison did, however, elicit from every bank employee a denial that such a line of credit ever existed or was even possible. He also elicited from just about everybody who was ever in contact with Smith that none of them had ever heard of this line of credit.

Smith's argument, however, was little easier. Moore, his attorney, was left to arguing that Smith had a "fool's belief" in the reality of this unlimited line of credit and that this was enough to preclude his guilt. On the 37th day of trial, the jury found Smith and Marshall guilty of most of the counts against them.

Was Wells Fargo A Computer Crime?

For the last several years, Congress, numerous state legislatures and various interest groups have been attempting to define computer crime.

As is often the case in a democracy, many of the suggested definitions reflect the interests of their proponents. Some major computer manufacturers and users have articulated the fear that people might misunderstand or mistrust computers if computer crime were broadly defined. IBM, for example, ran an advertisement showing a terminal in a "line-up" with several people, as though all were suspects in a crime. "The computer didn't do it," the advertisement reads, echoing the bumper stickers that read, "Guns don't kill, people do."


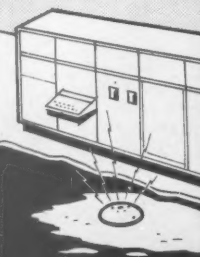
As might be expected, the definition of computer crime espoused by such groups is a limited one. Under this view, bank officials from the Security Pacific Bank and the Wells Fargo Bank have argued that the thefts of \$10.2 million by Stanley Mark Rifkin and \$21.3 million by Harold Smith, Ben Lewis and Sammie Marshall were not computer crimes.

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What Users Can Learn From the Case

1. With collusion, all things are possible.

Harold Smith proves that not all "computer criminals" are young, bright, qualified people willing to accept a technical challenge. When interviewed on television, Smith said, "Commit a computer crime? I can't even type."

Perhaps the key message in the Wells Fargo case is that with collusion, all things are possible. Smith had no trouble finding those people who knew what he didn't know. He went slowly and traded on other people's idealism and greed.

Smith had a number of people pulling for him within the bank. Each, it would appear, was drawn by the dazzle of his connections to Muhammed Ali and the world of big money. Each was in a position to help Smith get what he wanted. The only kind of genius this computer criminal needed was a genius in associating with the right people.

2. Beware "on-the-job training" in computer crime.

Employees trusted with access to company accounts have always been able to steal. With computing and the dispersion of access to company accounts that accompanies it, the number of would-be embezzlers grows dramatically.

When you train employees to work with your computer, you may be giving them the tools to commit computer crime. Neither Marshall nor Ben Lewis had to go to night school to figure out how to outsmart Wells Fargo's computerized accounting system. Marshall had worked in the bank computer center. Both he and Lewis had to know how the branch settlement system worked to do their jobs.

Apparently they knew what would cause a tracer to be issued and they had good cause to believe that no human would scrutinize their scam unless a tracer were issued. (Ironically, Wells Fargo was scheduled to implement another control soon that would have brought the theft to light.) Lewis made sure that no branch settlement amount exceeded \$1 million and that every 10 days the old transactions were replaced by new ones. These accounting matters taken care of, it was easy to cut cashier's checks or credit Smith's accounts.

If you cannot keep employees from getting valuable information, as was the case here, you can keep the information they get from remaining valuable. Good security procedures are usually designed from the premise that "the enemy" will eventually learn what the procedures are. Thus, changing the procedures or varying the triggers that cause the procedures' use are two ways that a busi-

ness can reduce its vulnerability to employee computer crime.

3. A "foolish consistency" in investigation is another invitation to crime.

An observation most easily made in retrospect is that parameters for investigation should be altered. Instead of always investigating imbalances of more than \$1 million or always waiting 10 days before sending a tracer, a sophisticated system could easily alter its operating parameters from time to time. In addition, more sophisticated tests such as for the distribution or frequency of transactions or other patterns could be performed with currently available software. These would make it much more difficult for the would-be embezzler to predict his chances of being detected.

Also, the parameters can be much more cautiously drawn than was the case here. It is inordinately costly to wait 10 days for the resolution of an imbalance; few banks will allow such a delay. According to Stephen Ross, former data security officer for Irving Trust Co., "In some banks, if there is an imbalance in the settlements one day, it goes to the branch manager the next, and if there is an imbalance that day, it goes to a higher level of management. There aren't many imbalances where that kind of situation applies, you can be quite sure."

4. Authority degraded is authority denied.

In viewing the relationship between Lewis and his boss, Brian Feeley, we can see an all-too-common degradation of authority. The controls that originally called for Feeley to supervise Lewis' work enforcing the security of the Beverly Drive branch were allowed to deteriorate. Lewis was delegated the function of overseeing branch security because of Feeley's misplaced trust in him.

"I had a lot of confidence in Ben. I trusted him. I felt that we had a very good close working relationship," Feeley testified at the trial.

It may be a little bit difficult to square Feeley's view of Lewis with that expressed by Smith's attorney, Howard Moore: "Mr. Lewis was ... what we call a 'high signer.' He lived a high life."

In retrospect, Feeley seems to have been unusually unsuspicious. He was aware of an entity called Lewis & Smith Enterprises. He testified that it was a name under which Smith had decided to do business in order to promote concerts.

Testimony showed that at the very least, Lewis had something to gain if Lewis & Smith Enterprises did well. Feeley believed that if Smith was successful in getting the business

started, "later on up the road, there would be an opportunity perhaps for Ben to go to work with him at that time."

However, Feeley also testified that he believed Lewis was not part of the organization because that was what Lewis had told him.

However, the plates on Lewis' car (which was paid for with funds embezzled from the Wells Fargo Bank) read LSENT, for Lewis & Smith Enterprises. Lewis actively sold tickets to a Shirley Bassie concert that Feeley attended and that Lewis & Smith Enterprises promoted. Feeley himself even worked for Smith on the Jose Cuevas-Thomas Hearn fight in July 1980. (He made a grand total of \$50 plus a warm-up suit).

Thus Feeley found himself in the embarrassing position of testifying to possible violations of bank procedures by Lewis, his trusted subordinate.

The bank had rules to prevent conflicts of interest. An officer responsible for a particular customer's account could not have any outside interest in that customer's affairs, Feeley testified.

His conclusion about Lewis' lack of conflict of interest seems questionable. Feeley directly admitted that Lewis violated another bank rule requiring a two-week vacation each year. (Again, hindsight tells us why. Lewis needed to keep submitting new branch settlement forms to the computer).

5. Eternal vigilance is the price of computer security.

As "differential association" theorists would predict, this \$21.3 million crime began with acts that were only slightly less legitimate than what ev-

eryone else was doing. Cashing a check on an out-of-state bank is not an unheard-of practice. Holding off on collecting a debt from a regular customer is also within the norm. But, as we have seen, however legitimate the favors to Smith were in mid-'76, they had become wildly illegitimate by late '78.

Closer observation of Smith's affairs as they teetered near disaster for quite some time might have substantially reduced the bank's ultimate losses.

Another kind of vigilance is required: vigilance against "petty corruption" or even the appearance of possible petty corruption. It seems quite reasonable to assume that Smith knew the value of favors. He seemed always to tie a new request to a new favor. Lewis was given a two-for-one honeymoon before Smith asked for his first favor and a trip to New Orleans after Lewis agreed to hold a bouncing check.

Lewis had offered Feeley a position in Lewis & Smith Enterprises. He had said that once the boxing business was going better, this would be a possibility. Feeley testified he didn't take the offer too seriously.

One must wonder whether Lewis' offers of employment to Feeley, hiring Feeley to work at the Cuevas-Hearn fight — and even Feeley's attendance at the Shirley Bassie concert — reduced Feeley's ability to be vigilant in requiring the enforcement of the rules the Wells Fargo Bank expected him to enforce. It has been noted that those who are not without guilt may find it hard to "cast the first stone." Implementing this insight in modern business is not easy.

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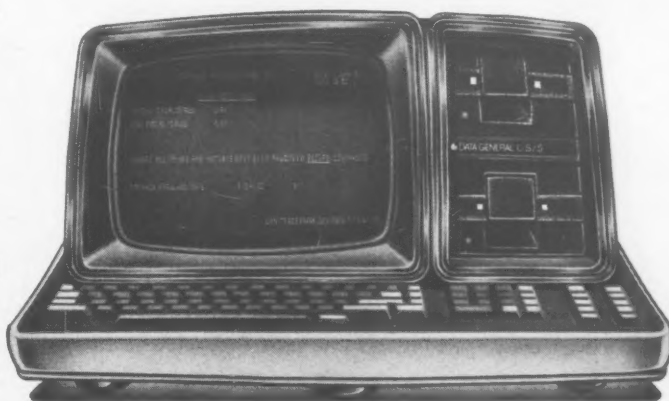
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definition of computer crime found in the computer crime laws now in force in 16 states. Only careful analysis will help us understand whether the definitions used in these statutes would — or should — serve those interests and fact situations like the one presented in the Wells Fargo case.

To set the stage for such a consideration, let's see whether the Wells Fargo case could have been prosecuted under California's computer crime

law, California Penal Code Section 502. California's bill is representative of most computer crime laws, and the crime took place in California.

Consider California's definition of computer crime: "Any person who intentionally accesses or causes to be accessed any computer system or computer network for the purpose of (1) devising or executing any scheme or artifice to defraud or extort or (2) obtaining money, property or services with false or fraudulent intent,

representations or promises shall be guilty of a public offense."

Under this definition, in order for an act to be a computer crime there must be an access to a computer system.

Now let's consider in detail what happened and ask whether the statute's definition of these terms is adequate to cover what actually took place. When a branch settlement form is issued, it is divided into two parts. Normally one part goes to POD, the proof department, and the other goes to the other branch within the bank whose accounts are affected. The half of the settlement form that goes to the other branch is then encoded with that branch's number and it is also sent to POD.

From POD both halves of the settlement form (along with a large number of other documents) are sent to the data processing center where a tape is made, and the information contained in the tape is sent via AT&T's Dataphone Digital Service to a computer in San Francisco. After the documents are received in San Francisco, they are kept as backup records.

With a "roll-over," both halves of the branch settlement slip go directly to POD. One half, however, is mis-encoded with the other affected branch's number. There is a 10-day delay before that half is sent to POD.

The first question we might ask is whether sending any document to POD is accessing a computer system. According to the definition of computer system in California:

"Computer system" means a machine or collection of machines, excluding pocket calculators which are not programmable and capable of being used in conjunction with external files, one or more of which contain computer programs and data, that performs functions, including, but not limited to, logic, arithmetic, data storage and retrieval, communication and control."

Question of Interpretation

Is the computer system only the machines, as a strict reading might imply? Or does the computer system include manual operations like POD which serve as conduits for information headed for the computer? While this question hovers unanswered, consider a second problem.

Is it accessing a computer system not to send a half of the branch settlement slip to the other bank when you are supposed to? Accessing a computer system is defined as follows: "To instruct, communicate with, store data in or retrieve data from a computer system or computer network."

This definition does not seem to cover failing to send information to the computer. It also does not deal with how direct the access must be, a question that is implicit in our discussion of the definition of "computer system" above.

Other computer crime laws do deal with these questions. Utah's law, for

example, defines access as "to directly or indirectly use ... or otherwise make use of any resources of, a computer, computer system ... or any means of communication therewith" (Utah Criminal Code 76-6-702 [1]).

Given the hardware orientation in the definition of "computer system" and the action orientation in the definition of "access," a good argument can be made that neither of these terms would apply to the Wells Fargo situation.

Prosecutors would doubtless argue (as do I) that there was a course of conduct consisting of falsification and manipulation of input to the computer system which had as its inevitable result a fraud by deception.

It is at this point that the question of whether Wells Fargo is a computer crime becomes truly relevant. Computer crime is no platonic ideal, shimmering outside the veil of our consciousness waiting for us to perceive it accurately. The definition of computer crime is a decision that various legislatures make to express certain social judgments about what property rights (and other rights) we will use our penal laws to reinforce.

The question is whether we want laws that will protect complex hybrid computer/manual banking systems such as this and, if we do, whether we are willing to take the necessary steps to change the computer crime laws as they are now drafted.

In deference to those who argue computer crime laws are not necessary, it is evident that in the case of Harold Smith, no such laws were needed. He was convicted without endless jury deliberation, without significant legal challenge and without evidentiary problems of significant note. However, the problems this case reflects will occur in other settings, since most complex business environments have the same sort of hybrid manual/computer systems as we have described. They would have the same sorts of problems defining "access" and "computer system" as well.

Was Wells Fargo a computer crime? We don't know. In Utah it probably would be. In California the courts have yet to define the law in any appellate cases. As we await their guidance, the case points out potential weaknesses in current definitions that legislators and interested parties would do well to explore.

About the Author

Jay BloomBecker is a Los Angeles attorney specializing in computer crime law. A former prosecutor for Los Angeles County, he now directs the National Center for Computer Crime Data, a clearinghouse for computer crime data.

BloomBecker is editor of Computer Crime Digest, a monthly scheduled to begin in September. His published work includes a book, *The Investigation of Computer Crime* (U.S. Department of Justice, 1980, available from the Government Printing Office).

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EDITORIAL

No More Mr. Nice Guy

The U.S. subsidiaries of Hitachi Ltd. and Mitsubishi Electric Corp. had lots of company late last month when they expressed astonishment at the news that 19 Japanese businessmen had been charged with conspiring to steal IBM trade secrets [CW, June 28]. For most Americans, the announcement came as no less of a shock.

Industrial espionage has become an unfortunate and even dangerous fact of life in the U.S. high-technology trade. However, such hostile activity is usually associated with the Soviet Union or other mortal enemies of the American free enterprise system. From supposed allies like the Japanese, Americans can probably be excused for expecting a higher standard of conduct.

No one, least of all U.S. mainframe manufacturers, can justifiably criticize the Japanese for their expressed intention to become world leaders in the general-purpose processor market. But the international battle for high-technology dominance ought to be waged fairly, according to rules that apply equally to all the combatants.

One of those rules is — or ought to be — that each of the warring parties should accept responsibility for developing most of its own technology and not be allowed to profit inordinately from the proprietary efforts of its rivals.

If the Japanese eventually achieve supremacy in the large-scale systems field through superior technological inventiveness, so be it. Any U.S. industry that allows itself to be outdueled by a foreign competitor in a fair fight has only itself to blame.

But fairness apparently had absolutely nothing to do with the alleged activities of the 19 accused Hitachi and Mitsubishi businessmen. On the contrary, they allegedly engaged in an illegal scheme to buy some of IBM's most sensitive and closely guarded product information. Had it succeeded, the scheme would have enabled the suspects' respective firms to enjoy all the benefits of IBM's technological advances without having to suffer any of the attendant costs or risks.

In their own defense, the Japanese have vehemently denied any wrongdoing and have accused U.S. counterintelligence forces, especially the Federal Bureau of Investigation, of engaging in "entrapment." They also see the recent allegations against the Hitachi and Mitsubishi employees as basically hypocritical. In the Japanese view, the suspects did nothing to IBM that American firms have not done freely to each other for years.

In the final analysis, last month's revelations of alleged Hitachi and Mitsubishi espionage did far more than just provoke an international incident and undercut Japan's carefully crafted reputation as a technological juggernaut. The disclosures — and the criminal charges that accompanied them — also sent would-be industrial spies around the world a clear and unmistakable message: The U.S. will not stand idly by and allow the fruits of its technological labor to be pirated by foreign interlopers, even when those interlopers profess to be our friends.

DATA PAST

Five Years Ago July 4, 1977

WASHINGTON, D.C. — The Senate voted to kill funds for the Veterans Administration's controversial computer claims processing system known as "Target."

About \$17 million of the \$21.9 million 1978 appropriation was struck down by a Senate subcommittee.

Ten Years Ago July 5, 1972

NEW YORK — Paper producers played a prominent role at the Data Processing Management Association exposition here. Almost one-third of the 75 exhibitors showed envelopes, continuous forms, carbonless papers, bursters and other "ancillary" equipment, one user observed.



LETTERS

Standards Moving Ahead

When I first read "Standard Likely for Data Base? Panel in Doubt" [CW, June 14], I was concerned by some errors in fact and by the focus on the uncertainty of the data base standards development process.

I excused both because of the craziness of the National Computer Conference combined with a tight publication deadline. Now that you have elevated this issue to the editorial "Go Ahead and Whistle" [CW, June 21], I am compelled to respond.

Computerworld's readers need to understand the roles of the individuals and organizations involved.

Dr. Terry Hardgrave is chairman of the Data Base Study Group, operating under the auspices of the American National Standards Institute's (Ansi) Committee X3/Standards Planning and Requirements Committee (Sparc). While he is employed by the U.S. National Bureau of Standards (NBS), he is only one of a number of voluntary participants in this X3 group who were incorrectly reported as being affiliated with NBS.

X3 standards committees are made up of individuals from various organizations with expertise in a specific technical area, such as data base, as the sole prerequisite for their participation.

Thus, if users feel the X3 standards process is not responsive, they can become part of the solution by joining the appropriate committee.

In the data base area, that committee is X3H2. Initially charged with developing an American National Standard for a Data Definition Language, this first X3 data base standards development committee has been active for less than four years, rather than the 10 years reported.

X3H2 did not forward its data definition language to X3 in 1981 because no Ansi standard programming languages were close to offer-

ing the data manipulation and subschema definition facilities required for a functional data base management system (DBMS) standard. Contrary to the report that the problem was a "lack of a universal data definition language," X3H2 was proud of its work on the data definition language.

Unfortunately, no one could evaluate or use it without the necessary programming language interfaces.

In response to this hiatus, X3H2 requested authority to develop a self-contained structured-network DBMS standard. Rather than the "regrouping" described by Computerworld, X3H2 has been aggressively working toward this objective.

When the X3/Sparc/Data Base Study Group recognized the need for a relational DBMS standard, it initiated X3 consideration of a project in this area. As a result, X3H2 has a clear mandate to develop DBMS standards for two important data models.

I do not agree with the pessimistic tone of Computerworld's articles. Useful data base standards appear more likely today than they have in years; they are not dependent on the actions of several committees, and they are not limited to only one data base approach.

The time frame in which these standards are available will be determined by the quality and quantity of the volunteers who assist in their development. X3H2 welcomes all technical experts interested in producing these standards in a timely manner.

I personally look forward to sending Computerworld a press release in the near future announcing the public review and comment period for the first American National DBMS standard.

Dr. Donald R. Deutsch
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SOFTLINE / Werner L. Frank†

A Look at Generic Software for Microcomputers

The word "generic," according to Webster's New Collegiate Dictionary, means "relating to or characteristic of a whole group or class." This term is being applied by microcomputer software vendors to computer programs designed for general use across a whole spectrum of requirements — industrial, personal and professional.

Unlike typical application programs and systems, which are oriented toward specific uses or vertical markets, generic software includes such capabilities as: data management system; graphics display system; planning/analysis system; word processing system; calendar/scheduling system; and communications system.

There have been very strong product entries for most of the above categories. The monthly issue of *Computer Merchandising* listing "best-selling" microcomputer software shows that eight out of 10 top retail sales fall into the word processing, data management and spreadsheet analysis categories.

Integrated Generic Software

Certain software manufacturers are now advancing toward the objective of providing integrated generic soft-

'Certain software manufacturers are now advancing toward the objective of providing integrated generic software in order to facilitate the use of the same data across a number of different functional programs.'

ware in order to facilitate the use of the same data across a number of different functional programs. Visicorp offers a number of products designated as the "visiseries," including Visicalc, Visiplot, Visitrend, Visifile and others.

Another organization, Software Publishing Corp., offers the Personal Filing System, with a graphics system that recently became available.

An even more substantial step in the direction of an integrated approach for generic software is Context MBA from Context Management, Inc. of Torrance, Calif. This software was developed within the framework of the UCSD P-System and is now being introduced for the IBM Personal Computer. Subsequent availability is planned for Apple Computer, Inc.'s Apple III and other popular hardware offerings.

Underlying the architecture of the MBA package is the grid, a two-dimensional matrix representation. The grid contains the data on which the various functional units operate.

This creates an interesting abstraction for those who are mathematically inclined. The individual functional systems and associated command structure can operate on these grids, either one cell at a time, or on row and column vectors.

In essence, these grids are tables or spreadsheet representations. As such, they lend themselves to the classical "what if" planning type of data processing made so popular by Visicalc.

In addition, the table structure is a natural foundation on which to build a data management system with attributes similar to a relational system. In other words, the very same table could be a source of input or output, serving both the planning and data management modules.

It is also possible to impose the graphics system on this structure by simply assigning an appropriate graphics command to a specific cell of the grid. In that cell may reside the formula which, when selected, will produce a graphical representa-

tion of data occurring in other parts of the same grid.

By selecting the contents of a particular graphics-defined cell and allowing as many as four variably sized independent windows on the screen, a plot of relevant data can then appear on the terminal display along with the display spreadsheet.

The word processing module also fits the fundamental construct. It is as if the two-dimensional array of the table were a filing cabinet where each cell is either a drawer or a document folder. Each such cell "drawer" would contain a number of text pages.

This, then, is the MBA word processing system. It is more flexible than others because a given document in a specific cell can reference data and other documents that may be stored in other cells of the same matrix.

There we have a summary of the way in which the four major generic software units tie together through the basic matrix representation.

Even that is not enough to warrant describing the MBA software as totally integrated. Not only do the individual software modules need an underlying common data representation base, but also the user needs to have a coherent and integrated command structure in order to deal with each of these software systems and do the appropriate cross-referencing and integration of the data itself.

This language integration is provided by the Context MBA through the uniformity of command procedures so that the syntax as well as the semantics for each of the four subsystems is the same.

Understanding One Is Key

Understanding one of the subsystems' structure and commands is tantamount to understanding all four. One moves from one system to the other by simply entering into the command action line the request for initiating one of the other modules.

The system then responds immediately, without requiring disk switching and reloading.

The Context MBA is impressive and it works. There will be a lot of interest and attention showered on this new software because it fills a necessary role as a professional productivity tool.

It is an answer to the software needs of the vast army of personal computer users, especially those in larger companies.

Frank is executive vice-president of Informatics General Corp. in Woodland Hills, Calif.

Correction

In the original manuscript of the previous Softline column ["Some Suggestions for Improving Productivity," CW, June 21], Frank had correctly identified the creator of Visicalc and the promoter of the DIF standard as Software Arts, Inc. of Cambridge, Mass., and not Visicorp, as stated in the published version.

HUMAN CONNECTION / Jack Stone†

Let's Work Together: Sharing the Burden of Systems Support

Everybody in this business knows that programmers enjoy writing systems documentation about as much as they like contracting the plague.

The lack of documentation was particularly grating to Stephen Roberts, who led the systems development effort at Catholic University of America (CUA) and was on a multiyear effort to streamline his internal operations.

He ruefully related:

"The typical staff member on board put forth the timeworn argument that he didn't have the time to spend fooling around writing dumb documents that will not be read by anybody else. After all, only I am responsible for my system and I know it by heart."

"It was true that each system was handled by only one person. That was fine and dandy as long as the system operated correctly or the programmer was around when it didn't. But too often the system failed during nighttime production runs, the operators couldn't follow the re-run documentation, and the programmer-in-charge had to be called in."

"Until my new documentation plan was implemented, I was forced to handle the scheduling of staff off-hours with this heartwarming policy: 'No leaves, holidays, sick time or time off for surgery except between production runs.'"

"It was essential to develop a new operational policy whereby analysts

This is Part 10 of a continuing series on how to succeed as a data center manager.

and programmers shared responsibilities for systems support, and it was obvious that we had to cross-train current staff to do so.

"But this was very difficult to accomplish because we didn't have the documentation. Our programmers thought it was faster to write programs from scratch rather than try to write the documentation to facilitate changes by other programmers."

"Analysts and programmers detest writing documentation because they consider it a waste of their creative efforts. They don't understand that documentation is an essential part of the systems development process."

"And yet programmers responsible for code are the appropriate people to handle the job because they have the detailed information necessary for the documentation."

"It's been my experience that neither DPs nor their managers allocate the time required to prepare documentation 'after the fact' of systems development. Therefore, my approach was to prepare it 'before the fact' because the systems specification and the documentation should be one and the same."

"This strategy has three major advantages:

"First, the final documentation is

typically 90% complete before the project begins. Second, the write-up is more comprehensive than before because the analyst or programmer is required to provide the detailed information necessary for a different person to create or revise a system."

"And third, it offers a method to the staff for organizing and maintaining a massive amount of notes, information and ideas."

"The CUA documentation standard is organized into sections that follow the general flow of the systems development process. Chapter titles are: system definition; system requirements; system flowchart; computer system schedule; input/on-line instructions; printed outputs; data files; jobs; and programs."

"The documentation is considered to be a reference manual not only for the systems staff, but it also contains sections to assist the users. These sections are written in terms that can be understood by the least technical person who will read them."

"Finally, documentation for all major systems is prepared using word processing software installed on our mainframe."

"It took several years before the standard was fully accepted by the staff — who now complain when they have to take responsibility for a system that is not fully documented."

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

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Job Seekers Find Their Way With 'Explorer'

By Robert Batt

CW West Coast Bureau

WOODLAND HILLS, Calif. — With the economic recession and high unemployment continuing to impact the lives of millions, life is tough for students fresh out of high school and college. Computer users and vendors across the nation are taking a harder look at potential trainees as they search for DPers who can get the job done.

A firm here called Options Unlimited has developed software to help an inexperienced job seeker find his way in the marketplace. Dubbed Explorer, the software was designed to search Options Unlimited's data base, which contains up to 100K bytes of memory running in single-batch mode, to find the best match between a person's abilities, interests and needs and the 12,000 jobs it has listed nationwide.

The Explorer user fills in a job profile sheet detailing interests, abilities, educational plans and preferred work situations or industries. This information is then fed into a computer at Options Unlimited headquarters, and the results are sent to the user for a fee of \$35.

'No Reliable Information'

Bill Irwin, vice-president of marketing for Options Unlimited, explained, "There is really no reliable accurate information concerning occupational options. For example, most of the occupations opening up in DP are not recognized by the general public as job careers. There are a great variety of specialized jobs classified as DP jobs, and the job seeker needs to be able to identify these jobs and find out which ones are suitable.

"For example, Explorer will make 26,000 comparisons of your search profile with each of 52 job-trait factors that define the 4,000 vocations employed in the state of California alone. It will also search out information in the data banks about job-demand trends, beginning-salary levels and sources of education and training programs in your residence area," Gary Kelly, president of Options Unlimited, said.

"As we develop Explorer, it could mean that employers will have less use for using headhunters and advertising, and we are looking for licensing and franchise arrangements with such people," Irwin explained.

Interdepartmental Relations

He said he also believes the package will affect relations between the DP and human resource departments within corporations.

On the one hand, it will bring them closer together. "Traditionally, DP has supported the human resource function very poorly. In the future, the human resource function is going to be more important, and the retention, training and outplacement of people is going to put demands on DPers that they haven't had to deal with before," Irwin added.

On the other hand, however, the firm recognized that tensions could actually increase between the two areas.

The Explorer package runs on large IBM systems, Control Data Corp. computers and Hewlett-Packard Co. equipment, among others.

College Goes Off-Campus For On-Line Registration

BOSTON — Although colleges and universities often teach computer science and programming, they often suffer from the "barefoot shoemaker's son" syndrome when it comes to their internal use of data processing.

By the summer of 1980, the Program of Continuing Education (PCE) at Boston State College (now the Huntington Avenue campus of the University of Massachusetts, Boston) faced a number of problems. These included the lack of management information needed to make profit-affecting decisions, late reports that were critical in making "go/no-go" decisions on planned classes and output reports that no longer served the needs of users.

After consulting his staff and contracting for a detailed study by a national accounting firm, Dr. Rodney A. Lane, dean of PCE, decided that an outside computer company was the answer.

In August 1980, Applied Educational Systems, Inc. (AES) of Lexington, Mass. was selected. This firm recommended an on-line continuing education registration and reporting system (Cerr), which was installed by the middle of October 1980.

Initially, the Cobol programs were installed on a Digital Equipment Corp. Decsystem-10 time-sharing computer. Dial-up

BCS Gives 'EIS' Modeling Ability, Support for 3270

VIENNA, Va. — Boeing Computer Services Co. (BCS) has released an enhanced version of its Executive Information Services (EIS) integrated decision support package that is available via the vendor's time-sharing network and also on a license basis for use on IBM and plug-compatible systems running under VM/CMS.

The new EIS features are extended business modeling capabilities, expanded support for color graphics and the ability to support the IBM 3270 family of CRT terminals, Boeing said.

The new modeling techniques are intended to increase logical testing capabilities, provide structured programming tools, eliminate the need for labels or directions in a model and facilitate the extraction of precise subsets of data through Boolean search criteria.

EIS users reportedly can now produce high-quality color graphics with a variety of flat bed plotters and color CRT devices. All graphics options, including shading, cross-hatching and character sizes are available in color, a Boeing Computer Services spokesman said.

EIS consists of several components that are bound together by a set of English-like commands and a common data structure, he noted. The components include a modeling language, report writer, data base manager, graphics and libraries of statistical, forecasting and financial applications functions.

On a time-sharing basis, EIS is priced according to the resources used.

The license fee for the stand-alone package is \$55,000 for the basic system and then per-module prices, which can bring the entire package cost to \$170,000.

Boeing Computer Services can be reached through P.O. Box 24346, Seattle, Wash. 98124.

phone lines (300 bit/sec) and LA-36 Decwriter computer terminals were used to communicate with the Decsystem-10.

Although this system was a major improvement over previous card-related batch processing, its drawbacks were costs and phone-related problems. Also, all batch reports had to be run at night by AES, and 12-hour-old batch reporting was not really satisfactory.

College System Ruled Out

Boston State College considered using the Massachusetts State College Computer System, but ruled this out because of operational and system software constraints. Other time-sharing arrangements using leased telephone lines were investigated but discarded because of excessive costs or length of commitment required.

Lane's group decided to purchase a mini-computer that would be located in the PCE office. Several mini and micro systems were investigated, but they were found to be inadequate because of language restrictions, file accessing methods, costs vs. capabilities and hardware delivery times. Finally, AES found that a Datapoint Corp. 6600 met the school's system requirements of Ansi Cobol, delivery within 60 days, removable disks, expandability for both disk storage and processor/core, maintenance/support center located within proximity of Boston State and a proven hardware system.

When the Datapoint hardware arrived, AES had already converted the initial on-line programs, so the conversion to the in-house mini was accomplished on Sept. 2,

(Continued on Page 39)

Budgeting Package Available via T/S Or for IBM CPUs

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) has announced the Corporate Planning Language (CPL)/Tactix System, a budgeting and financial analysis package that is available both via Geisco's Mark 3000 time-sharing service and on a licensed basis for in-house IBM and plug-compatible mainframes running in either MVS/TSO or VM/CMS environments.

CPL/Tactix provides planners and analysts with an electronic replacement of the spreadsheet, with a means of obtaining financial data from company facilities in dispersed locations and with a tool that allows financial modeling for ad hoc analysis, Geisco said.

The software reportedly offers one interactive interface to full-screen terminals, communications lines, color graphics systems and mainframe computers. This is intended to facilitate data input, error checking, full screen editing and scrolling, graphical presentation and recalculation of reports.

CPL/Tactix includes built-in financial functions for use in cash flow analysis, short- and long-range budgeting and planning, revenue consolidations, pricing and profitability analysis, the vendor noted.

CPL/Tactix is available at an annual cost of \$22,000, including maintenance. Used via the time-sharing net, it is priced on a transaction basis, Geisco said from 401 N. Washington St., Rockville, Md. 20850.

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Expanded memory — For most of the enhanced systems in the new series, potential memory is increased from 50 to 100 percent. Maximum memory now ranges from one megabyte for the V-8535-II to eight megabytes for the dyadic V-8595-II.

New dyadic systems — The NCR V-8500-II Series now includes three dyadic systems. Systems that combine symmetrical, tightly-coupled dual processors in a single cabinet. Both processors share all system resources equally with continuous dynamic load leveling.

Migration Path Engineering — As always, NCR provides easy transition from one system to the next without difficult conversion of software.

For more information, just call toll free (800) 543-8130 (in Ohio, 800-762-6517). Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

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Enhanced Utility Supports IBM 3375, 3380 Storage Facilities

CAMBRIDGE, Mass. — An enhanced version of Programart, Inc.'s Disclose utility has been announced, which reportedly provides for the new indexed Volume Table of Contents and supports IBM 3375 and 3380 direct-access storage facilities.

Disclose is intended to provide reporting of data set allocation and use for IBM and plug-compatible mainframes running under OS and VS. Its major report is a single alphabetical listing of all data sets from the sys-

tem catalog and as many as 512 disk volumes. It is said to show their characteristics, space allocated and space used. Optional reports show storage allocation on a track-by-track basis, maps of free space on volumes, tape-resident catalogued data sets and selective reports by data set names, the vendor said.

Disclose is available for a one-time site license price of \$1,800, the vendor said from 30 Brattle St., Cambridge, Mass. 02138.

IBM VSE/ICCF Interface Added To Johnson's 'Jars'

MCLEAN, Va. — Johnson Systems, Inc. has announced its latest option to its Job Accounting Report System — an IBM VSE/Interactive Computing and Control Facility (ICCF) Interface.

The interface reportedly enables the data center manager to measure and bill equitably each ICCF user for all resources used. Measurement statistics are provided for ICCF CPU, I/O and disk-space

activity, according to a Johnson Systems spokesman.

The software is said to operate on DOS or OS IBM 370, 30 series, 4300 series and compatible processors, the spokesman said.

The introductory price of the software is \$2,000.

Additional information is available from Johnson Systems at 8300 Greensboro Drive, McLean, Va. 22102.

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Runs Under DOS/VSE Release 2

Dasd Vtoc Program Out for IBM Systems

MINNEAPOLIS — A direct access storage device (Dasd) Volume Table of Contents (Vtoc) program for IBM and plug-compatible mainframes running under Release 2 of DOS/VSE is available from Davis, Thomas and Associates, Inc.

The software was designed to display Dasd Vtocs in a batch report in a more concise fashion than IBM's standard software, the vendor said. The report is typically one or two pages and lists, either sequentially or alphabetically, all Dasd files by vol-

ume and file ID. It is then broken down by file type, extent type, starting and ending block, total number of blocks per file and creation and expiration date.

The report summarizes at the end of each Dasd volume the available free space and breaks down by access method, the file characteristics on that pack. Included with this package is an option excluding expired files from the report.

The program may be obtained on tape, complete with installation instructions by sending \$16 (to defray production, postage and handling costs) to Davis, Thomas and Associates, Inc., Suite 301, 8800 Highway 7, Minneapolis, Minn. 55426.

Electronic Spreadsheet Package Now in Virtual Memory Version

TULSA, Okla. — Datamate Co. has introduced a virtual memory version of its electronic spreadsheet package for NCR Corp. I-series and Texas Instruments, Inc. TI 990 minicomputers.

Release 2.3 of Finanswer/Plus reportedly includes an expanded spreadsheet of 40 rows by 60 columns, increased processing speed through optimization of the calculation process and new editing features.

The software is said to allow a menu of up to 12 spreadsheets per file, with password security on each one. The virtual memory capacity allows the user to link any or all of the spreadsheets together, creating a spreadsheet with a maximum of 480 rows or 720 columns.

The package also includes a help screen, interactive design and auto-

matic save and restore of the spreadsheet rules and figures from disk.

Finanswer/Plus is available for \$995 from Datamate Co., Suite 101, 4135 S. 100th E. Ave, P.O. Box 4159, Tulsa, Okla. 74104.

College Chooses On-Line System

(Continued from Page 35)

1981. To the terminal operators, the changeover was transparent except that everyone had CRT terminals rather than Decwriters and the response time on the new terminals was improved, Lane explained.

Batch reports were printed upon request on the 300 line/min printer located in the PCE office. Notices to students confirming or canceling classes could be processed as required. Financial reports were available as of the end of each processing day.

The availability of up-to-the-minute management reports has allowed important decisions to be based upon hard facts, according to Lane.

As an intangible benefit, the entire PCE staff has undergone a morale boost, based upon "ownership" in the design and implementation of a modern, innovative professional system.

Utilizing a student data base concept, the Cerr package allows a prospective student to register for any class and to know if there is space available. If the class is canceled due to low enrollment, registrants will be notified in sufficient time to make other plans.

Students complete application forms and present these to continuing education representatives who forward them to one of the three terminal operators.

If the class enrollment limit is exceeded by this student's registration, an appropriate message is displayed and the student is notified while still at the continuing education registration counter.

SDM/70 Goes 'Structured'

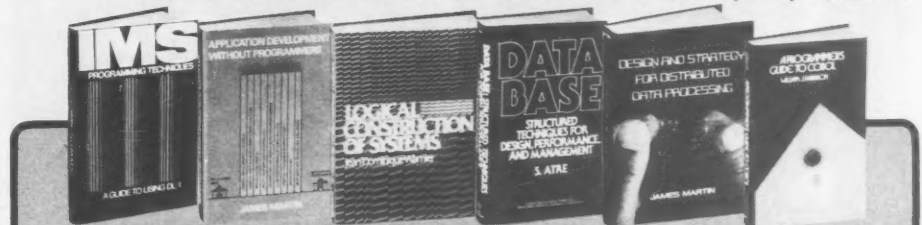
PHILADELPHIA, Pa. — Atlantic Management Systems, Inc. has developed a "structured" version of its SDM/70 Systems Development Methodology.

Structured SDM/70 is said to include the latest structured analysis and design technologies, plus incorporate considerations including project administration, economics, auditability and data control, as well as systems and user documentation.

Pricing for the as-yet-unreleased software tool is thought to be in the \$50,000 to \$60,000 range. A fourth quarter 1982 release date is planned. Further details can be obtained from the vendor at 320 Walnut St., Philadelphia, Pa. 19106.

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Release 4.0 of Acep Includes IBM System Productivity Facility

DANVILLE, Calif. — A.A.I. Systems has announced Release 4.0 of its Advanced Conversational Editing and Programming (Acep) package, which includes an IBM System Productivity Facility option.

Designed for IBM and plug-compatible systems running under VS1 or MVS, Acep includes a text editor with full searching and string replacement facilities and several methods of scrolling. With IBM 3270 display terminals, full-screen and split-screen editing is possible, the vendor spokesman noted.

Users reportedly can simulta-

neously edit different modules in Acep's 10 Virtual Active Areas (VAA). The VAA represents the working space of the text editor and is directly written onto a disk file for restart capability. If the system fails, Acep is said to restore the VAAs of each user to the point of last alteration.

The package's features include on-line time sharing, support for more than 100 programmers and password protection.

The entry-level price is under \$10,000. A.A.I. Systems is headquartered at 2500 Old Crow Canyon Road, San Ramon, Calif. 94526.

Enhanced 'CICS/Table-Aid' Includes Testing Facility

NEW YORK — FTW Associates, Inc. has enhanced its IBM CICS/Table-Aid software package for IBM and plug-compatible mainframes to include a Module Testing Replacement Facility. The facility reportedly enables a CICS application programmer to test a new version of a program at one terminal while the original version is used concurrently at other terminals.

Other features of Release 3.0 include the Extended Table Search Facility, the Entry Modification Security Facility and the Activity Display Facility. The search facility allows the Table-Aid user to locate specific processing program table or program

control table entries based on such criteria as program size, load address, storage violation count, use count and others. The security facility provides the capability to control Table-Aid usage based upon CICS sign-on. The activity facility provides a summary display of all Table-Aid usage recorded on the activity file.

CICS/Table-Aid Release 3.0 is available at a single-CPU license fee of \$5,000, from FTW at 120 Wall St., New York, N.Y. 10005.

'FRS' Targets Prime Series 50

SCHAUMBURG, Ill. — Advent Online Knowledge, Inc. has introduced a Financial Reporting System (FRS) for the Prime Computer, Inc. Series 50 minicomputers.

It can be used for "what-if" financial analysis as well as for balance sheet, income statement and statement of financial positions. FRS comes with a data entry module, plotting capabilities, flexible report writer and an interactive screen editor that is also suitable for use as a stand-alone word processor, the vendor said.

FRS is said to foster the efficient access and reporting of information. With the file created, the user has multiple reporting capabilities.

The initial license fee for the package is \$3,000 including source code. License fee for a "run only" version is \$1,000 from Advent Online Knowledge, Suite 133, 1305 Wiley Road, Schaumburg, Ill. 60195.

Software Backs Prime Users

WOOD DALE, Ill. — Computronics, Inc. is offering software for Prime Computer, Inc. users that summarizes the current configuration for each asynchronous multiline controller (AMLC) line on the system.

For many Prime systems, the line configuration is volatile, and a glance at the system configuration file will not tell the user the up-to-date configuration, the vendor explained.

The AMLC Status Software consists of a change to Prime's Primos operating system. Source code for the change is provided with the software. AMLC Status Software costs \$550 for the supported version and \$250 for the unsupported version. Computronics is located at 130 N. Ash, Wood Dale, Ill. 60191.

Firm Offers Schools Free Perpetual License

ATLANTA — Interprocess Systems, Inc. has announced that academic institutions can receive a free perpetual license for the firm's entire line of APL enhancements.

The software normally costs up to \$35,000.

Interprocess Systems is in Suite 608, 6065 Roswell Road N.E., Atlanta, Ga. 30328.

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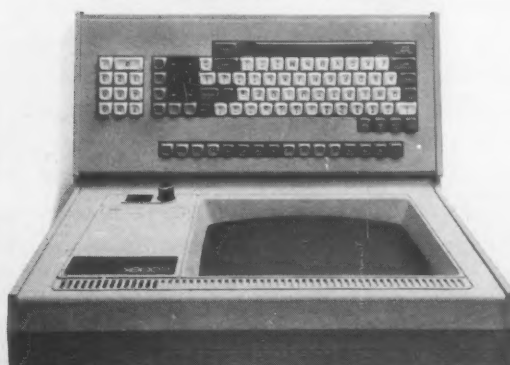


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MOTOROLA INC.
Information Systems Group

'DRS' System Available For VAX-11s

KINGSTON, N.J. — Advanced Data Management has announced versions of its DRS data base management and application implementation system for Digital Equipment Corp. VAX-11/750 and 730 superminis.

The base DRS system includes the data base management system; a high-level query language with update, computation and reporting facilities; an interactive data base generator; and a self-training system. Available options include Report Writer II, an advanced reporting system; Screen Input Processor, a CRT forms-handling language and transaction processing system; XBS, the programmer interface; and Plot, a data base graphics package.

Prices for the 11/750 version begin at \$30,000, while the 11/730 version has a \$20,000 base price. Both versions are available immediately from the vendor at 15-17 Main St., P.O. Box 601, Kingston, N.J. 08528.

Ross Announces Price Changes

PALO ALTO, Calif. — Ross Systems, Inc. has announced price changes on its line of financial and decision-support software for Digital Equipment Corp. processors.

The firm's Maps/Host or Intac packages now cost \$12,000 for DEC PDP-11/24 and 34 and VAX-11/730 processors; for the PDP-11/44 and the VAX-11/750, the cost is \$18,000.

The software costs \$24,000 for PDP-11/70 and VAX-11/780 systems and \$36,000 for the VAX-11/782, the vendor said.

Ross is located at 1900 Embarcadero Road, Palo Alto, Calif. 94303.

System/34 Gets Document Tool

WINTER PARK, Fla. — A documentation package for the IBM System/34 has been introduced by Westmoreland Systems, Inc.

With the software, user instructions and technical documentation for each menu item reportedly can be maintained and accessed on-line by programmers and users, according to the vendor.

The software is available on a 30-day trial for \$500 from Westmoreland Systems, Inc., Suite 1, 228 Park Ave. N., Winter Park, Fla. 32789.

Inquiry Facility Runs on Level-66

BENNINGTON, Vt. — Shared Systems Technologies, Inc. (SST) has announced an interactive data base inquiry facility designed for Honeywell, Inc. Level-66 computers.

SST-Query is reportedly capable of extracting information from a variety of data bases via English-like commands. The package features automatic formatting of output, plotting

Contel Expands RTFile DBMS

BETHESDA, Md. — Contel Information Systems has expanded its RTFile data base management system (DBMS) to include an integrated multiuser operating system.

RTFile-Plus uses a base-line version of the firm's Share-11 multiuser operating system to allow up to four interactive users to utilize the resources of a Digital Equipment Corp. LSI-11 or PDP-11 running the RT-11 operating system, the vendor explained.

RTFile-Plus reportedly also includes the multiuser version of RTFile, which allows multiple users to lock records and/or files to ensure consistency when updating shared files.

RTFile-Plus costs \$3,000 from Contel, 4330 E.W. Highway 200, Bethesda, Md. 20814.

'Datamodel' Fits DEC, Prime Gear

SEATTLE — Minicomputer Modeling, Inc. has announced a financial modeling package for Digital Equipment Corp., Datapoint Corp., Prime Computer, Inc., and Wang Laboratories, Inc. processors.

Called Datamodel, the package can be used by managers, analysts and nonprogrammers to replace work usually done on a spreadsheet, the vendor said.

Features include three-dimensional modeling, "what-if" analysis, investment analysis and goal-seeking, the vendor said.

The package costs \$4,000 for a permanent license fee, the vendor said from Queen Anne Square, Suite 508, 200 W. Mercer, Seattle, Wash. 98119.

'Report-11' Out For PDP-11s

TORONTO — Act 4 Co. has announced Report-11, a report writing package for users of Digital Equipment Corp.'s PDP-11 system running under the RSTS operating system.

The package provides on-line interactive report program development in either an interactive or batch environment.

The package supports multiple keys and files in one report. Options include beginning and end keys plus an output device that makes the package suitable for data inquiry purposes, according to the vendor.

The package is priced from \$99, the vendor said.

Additional information is available from the vendor at Suite 603, 347 Bay St., Toronto, Ont. M5H 2R7 Canada.

and statistics, generation of Cobol file descriptors and a built-in Help facility.

SST-Query runs under Honeywell's Time Sharing System executive in 35K words of memory. A single license for SST-Query costs \$9,500; a 90-day trial is available. SST is located at Rt. 7 S., Box 163, Bennington, Vt. 05201.

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From Comsoft Systems

Systems Designers Get Support

MINNEAPOLIS — Comsoft Systems, Inc. has announced its first licensing of systems design documentation in hard-copy form that is intended for end-user, OEM and consultant usage. Designs reportedly include hundreds of schemes for systems designers for use in building or evaluating on-line business applications.

The designs are available for minicomputer and mainframe computers on property

management, property developer construction costs, production control, manufacturing job costing, scheduling, routing, wholesale distribution and prospect/ mailing list management. Each represents research and development in specific vertical market problems, according to the vendor.

The designs include overview materials, subsystem and file integration points, transaction details, report

layouts, screen formats with field-by-field processing rules and file layouts with data names from the actual source code. Documentation ranges from 50 pages to 700 pages per system, and is licensed on a single-user basis.

Prices for the designs start at \$75 and the whole set is \$500. A complete list of designs is available from Comsoft at 5100 Eden Ave., Minneapolis, Minn. 55436.

Cobol Source Code Illustrator
Runs on HP 3000

EAST LANSING, Mich. — Forest Computer, Inc. has added a Cobol source code illustrator module called Chicken Tracks to its Chicken/3000 system for Hewlett-Packard Co. HP 3000 users.

The module is intended to enable the user to view Cobol programs executing at the source-code level. Its display reportedly can optionally be directed to a hard-copy device. Another option al-

lows Chicken Tracks to be run in a remote mode, allowing the program to execute on one terminal while displaying code on another.

Chicken Tracks also features a command mode that allows the user to change the delay time between trace lines, view and modify the contents of variables, enter a single-step trace mode and access an on-line help facility, the vendor explained.

The Chicken/3000 system includes a full-screen block mode editor, a Cobol preprocessor and a Cobol documenter. A perpetual license for the full system, including Chicken Tracks, is available for \$6,000. On an annual license fee basis, the software is available for \$2,275 for the first year and \$1,275 for each subsequent year, from the vendor at P.O. Box 1592, East Lansing, Mich. 48823.

Three DG Processors Get
Four Accounting Packages

ATLANTA — Technical Analysis Corp. has announced four accounting packages for Data General Corp. Nova, Micronova or Eclipse processors.

Written in Business Basic II, the packages offer basic accounting functions including general ledger, accounts receivable and payroll. Each of the four modules is available under DG's DOS, Rdos and AOS operating systems.

The packages are called: General Ledger/Financial Statements II, Accounts Pay-

able II, Accounts Receivable II and Payroll II. Each package costs \$1,950 under DOS and \$2,500 under AOS or Rdos, according to the vendor, located at 120 W. Wieuca Road N.E., Atlanta, Ga. 30042.

Claims Aid
Out for DG

MINNEAPOLIS — A medical insurance claims processing package designed for Data General Corp. Eclipse computers has been announced by Lawson Associates, Inc.

Proclaim, aimed at third-party administrators, self-insured businesses and insurance companies, is said to feature coordination of benefits, verification of coverage at multiple levels, duplicate expense checking and historical tracking of deductibles and benefits.

The system also automatically calculates and pays claims and has full audit capability for claim check and account history. The software costs \$70,000 from the vendor at 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.



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For Basebands Using CSMA/CD

Vendors Back Ethernet-Like Net Protocols

By Phil Hirsch

CW Washington Bureau

PITTSBURGH, Pa. — Nineteen vendors recently endorsed a set of Ethernet-compatible local-area network protocols, a development that is expected to make it easier for several different makes of terminals and computers to communicate with each other when attached to such systems.

Altos Micros, Net Get Ethernet

SAN JOSE, Calif. — Altos Computer Systems, Inc. has announced Ethernet computer networking capability for its 16-bit microcomputers and an Altos-to-Altos high-speed networking scheme called Altos-Net.

Ethernet will permit the networking of up to 100 Altos 16-bit computers, with up to eight users/CPU. Ethernet makes use of coaxial cable running up to 1,500 ft in length, supporting transmission speeds of 10M bit/sec. At any place along the way, an Altos computer may be attached via a small transceiver, using an interface cable stretching up to 150 ft.

The networking scheme will permit Altos users to share data bases among several computers, pool expensive peripherals and expand their systems extensively, the vendor claimed. Once tied into the network, users can share files, send and receive electronic mail and emulate other terminals from their own.

The new networks implement Altos-Net/Unet networking software, running under the Bell Laboratories, Inc.'s Unix operating system. Because the two networking schemes — inter-Altos and Ethernet — share the same software, users can easily upgrade, an Altos spokesman said. Altos' Ethernet is priced at \$2,500/CPU, which includes Altos-Net/Unet networking software and the Ethernet controller. Cabling and transceivers are extra. The price of Altos-Net networking is \$295/CPU, plus cabling, Altos said from 2630 Bering Drive, San Jose, Calif. 95131.

Specifically, the recent agreement involves baseband networks employing Carrier-Sense Multiple Access/Collision Detection (CSMA/CD) to allocate the local-area network among attached stations.

The protocols, developed in Europe, implement Levels 1, 2 and 4 of the Open Systems Interconnection (OSI) model, a generally accepted diagram specifying the communications control functions to be implemented between the devices and processes at the ends of a message path, as well as between each device/process and intermediate points, such as the network node.

Level 3

The OSI includes a Level 3, devoted to internetwork communications, which is not included in the recent agreement because the latter level is restricted to communications within a single network.

According to Barry Rosen, vice-president of research and development for Three Rivers Computer Corp., it will be necessary to establish additional standards — at Levels 5 and 6 of the OSI model — before total interconnection of dissimilar devices within an Ethernet CSMA/CD network will be possible. But he regards the recent

agreement as a "significant step forward," primarily because it will "make the Level 5 and 6 standards much more useful and thus accelerate efforts to reduce remaining disagreements."

Some workable protocols already have been developed at these two levels, he added.

The 19 companies that will implement the European protocols include six based in the U.S. — Digital Equipment Corp., 3Com Corp., Three Rivers, Ungermann Bass, Inc., Hewlett-Packard Co. and Intel Corp. — plus several that market products in the U.S. Among the latter are Mitel, Inc., Ericsson, Nixdorf Computer Corp. and Siemens Corp.

"At the physical and data link layers (Levels 1 and 2), these standards are largely compatible with Ethernet," Rosen said. However, at Level 4 there are "greater differences" between the European specifications and their American counterparts — in particular, the Level 4 protocol developed by Xerox Corp. and those being discussed within the Institute of Electrical and Electronic Engineers (IEEE), the group most closely identified with development of local-area network standards in this country.

(Continued on Page 50)

Terminal Concentrator Connects Up to Eight Asynchronous Units

HUDSON, N.H. — A terminal concentrator that reportedly connects up to eight asynchronous terminals to a Digital Equipment Corp. PDP-11 minicomputer or VAX-11 supercomputer via a single synchronous, full-duplex communications link is available from DEC's Computer Special Systems Group.

The DZS11 concentrator is a statistical multiplexer that allocates the bandwidth of a communications line dynamically among users in proportion to the communications traffic each generates. It reportedly increases line utilization and efficiency, resulting in cost reductions over other types of multiplexers.

The DZS11 was designed for use in a variety of network applications, including local-to-local, local-to-remote and route-

through arrangements. By using it to combine several low-speed lines into a single high-speed data path, users can realize significant savings in costs of leased lines, cabling and modems.

It is compatible with DEC's standard DZ11 multiplexer and can be used with the firm's RSX-11M, RSX-11M-Plus, RSTS/E and VAX/VMS operating systems. The terminal concentrator is composed of a multiplexer (Model VT1XX-EB) that fits into a VT100 CRT terminal and a remote multiplexer (Model DSZS11-EA) that acts as a cluster controller and accepts up to seven additional user terminals as input devices. The DZS11-EA and VT1XX-EB comprise the DZS11 unit and cost \$4,050 each, DEC said from 10 Flagstone Drive, Hudson, N.H. 03051.

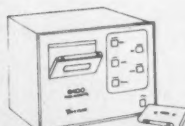
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Member of 264X Family HP's Graphics Station Versatile

PALO ALTO, Calif. — A multifunction intelligent graphics terminal — which may be used as an on-line intelligent terminal, an off-line graphics workstation or both — is available from Hewlett-Packard Co.

The HP 2647F is the newest member of the 264X family. Combined with any of the vendor's color plotters, it is a stand-alone graphics work-

station operable by users with no experience with computers.

When a printer and Word/47 software is added, it becomes a multipurpose word processing station.

When used in conjunction with a host computer, the device is reportedly a highly programmable intelligent terminal capable of serving as a distributed node to the

computer system. Computer professionals can write and execute programs to interact with programs on the host computer or to run independently on the terminal.

The HP 2647F costs \$9,950 with additional optional software programs available for from \$195 to \$295.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.

ISC's Color Terminals Fit DEC, Tektronix

NORCROSS, Ga. — Intelligent Systems Corp. (ISC) has announced two color graphics terminals — one of which emulates the Digital Equipment Corp. VT52 and VT100 terminals and one that emulates the Tektronix, Inc. 4014 — and a firmware package.

The VT52/VT100 Emulation Package was designed to offer VT52/VT100 users color and graphics options. The

system includes the firm's eight-color graphics display terminal with 13-in. or 19-in. screen, 117-key sculptured keyboard, terminal control software and the emulation package. Its price is \$3,320.

The 4014 Emulator Terminal, with a raster CRT screen, emulates the storage tube display of the 4014, fitting them to ISC's resolution. The \$4,450 price tag buys the emulation software with documentation and the firm's Model 8001R eight-color dot-addressable display terminal.

Flexware's three asynchronous communications protocol modes with keyboard- or host-definable parameters allows ISC terminals to be interfaced to a variety of hosts. The firmware costs \$250 from the company at 225 Technology Park, Norcross, Ga. 30092.

Vendors OK Protocols

(Continued from Page 49)

However, Rosen believes the recent European agreement increases the possibility of a Level 4 consensus developing here. The easier approach, he pointed out, would be for the IEEE to adopt the European Level 4 specification.

The European Computer Manufacturers Association developed the Level 1 and 2 specifications included in the recent announcement, while the Level 4 protocol grows out to work done by the International Standards Organization.

According to Jim Gay, president of Three Rivers, there has "never been such widespread endorsement of an emerging communications standard."



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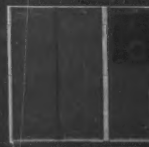
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The most powerful of these, the 48-bit Harris 800, won out over mainframe competition to become the center of Rotterdam's new interactive time-sharing system for scientific applications. With more than 350 users providing key municipal services, the city's system is the largest, most sophisticated installation of its kind in Europe.

For information on Harris leadership in interactive design, as well as the versatility of its high-performance super-

minicomputers, contact Ralph Mele, National Sales Manager, Harris Computer Systems Division, 2101 West Cypress Creek Road, Fort Lauderdale, Florida 33309. (305) 974-1700.



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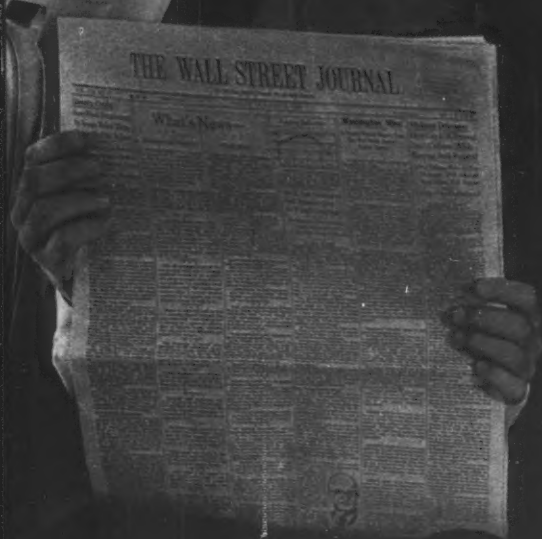
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Terminal 3278-Compatible

TULSA, Okla. — An IBM 3278 plug-compatible CRT terminal featuring a space-saving cabinet and keyboard has been announced by Telex Computer Products, Inc.

The 12-in. Telex 178 display is said to have all the 3270 attributes of the company's standard 15-in. screen 278 display station and to be 43% smaller and 54% lighter than the IBM 3278.

The unit operates in a 3270 cluster-controlled environment and attaches to either a Telex 174 or 276 controller or an IBM 3274 or 3276 control unit. The 178 was designed for displaying alphanumeric data and for I/O with IBM 360, 370, 30 series, 4300 or equivalent systems.

The Telex 178 costs \$2,750. Lease plans are available, Telex said from 6422 E. 41st St., Tulsa, Okla. 74135.

Excel Terminals Get Graphics, IBM 3270 Emulation Features

PENNSAUKEN, N.J. — Datamedia Corp. has announced a graphics capability and IBM 3270 emulation features for its Excel family of terminals.

The firm also announced color graphics capability for its Colorscan line of terminals.

A point-to-point graphics option reportedly allows us-

ers to upgrade Excel terminals to be fully compatible with Tektronix, Inc. 4010 graphics terminals. Features include vector drawing, point plotting, arc drawing, area fill and solid dotted or dashed lines. The option costs \$2,000, the vendor said.

The firm also announced a clustered terminal that emulates IBM 3270 series display

terminals. The clustered terminal emulates the IBM 3276-2 and 3278-2. Called the Excel 3270-6, the unit can be used with Excel's 3270-S (a unit that emulates an IBM 3275 terminal) and IBM 3276 stand-alone workstations.

The unit can communicate with an IBM host using a standard binary synchronous communications line protocol at up to 9,600 bit/sec. Each terminal has a separate bidirectional asynchronous printer port that can be configured by a user from the terminal keyboard, the vendor said.

The Excel 3270-6 costs \$2,895, the Excel 3270-8 costs \$1,995, and the Excel 3270-S costs \$2,295.

Datamedia's Colorscan terminals are being equipped with a color retrographics package offered by Digital Engineering, Inc. that reportedly gives Datamedia users access to a variety of software packages that utilize a Tektronix 4027 driver.

Colorscan terminals cost \$3,195. The retrographics board costs \$1,600, Datamedia said from 7401 Central Highway, Pennsauken, N.J. 08109.

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Tandberg Data, Inc.

The Tandberg TDV 2200 family is offered in different models emulating the DEC VT100 and VT52, Honeywell-Bull Questar and VIP 7255, Datapoint 3600 and 8200, Computer Automation CRT II, IBM 3101, Data General 6053 and D200 and others. An advanced performance model is also available for the development of application-tailored OEM terminals. So don't put up with a pain in the neck. You can increase efficiency, productivity and operator morale with a true ergonomic terminal—the only true ergonomic terminal in the world from Tandberg Data. Call or write today to: TANDBERG DATA, INC., P.O. Box 99, Labriola Court, Armonk, New York 10504. Telephone: (914) 273-6400 Telex: #137357 Tandberg Armk.



Correction

Infotron Corp.'s Supermux 380 statistical multiplexer [CW, May 24] comes in both four- and eight-channel versions. The four-channel model costs \$1,375 and the eight-channel model is priced at \$2,150. Infotron is located in the Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

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Starting below, and continuing on the following two pages, is a brief description of the key courses in each of the five curricula.

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Involve end users from the beginning.

ISMI offers a series of courses of primary interest to end users and the DP professionals who work with them. Most are designed for team attendance by the end user and the DP professional. They cover subjects where increased knowledge will help end users better understand their DP-related activities.

Project planning and control for users (3 days)

Shows users how to become an integral part of the application development process, from requirements and specification phases to the final program. Team attendance with a DP professional is encouraged.

Information Center implementation (2½ days)

Information Centers help shorten the development cycle by providing highly productive

tools and applications directly to the end users. This course is for managers responsible for the development and support of end-user facilities and for Information Center DP professionals interfacing with end users.

Planning for office systems (3½ days)

Teaches planning for office systems applications integrated with information processing and communications plans to meet user productivity needs.

Application backlog management (3 days)

Students will be able to more accurately understand the end user's requirements, estimate the scope of the work, determine the business case and assess risk. Helps to assure proper prioritizing of the application backlog based on return on investment and other objectives. Team attendance with DP is suggested.

Disaster recovery planning (2½ days)

This course demonstrates the techniques needed to help identify critical applications and shows how to implement, test and maintain an effective back-up capability before a major disaster strikes the computer facility.

Auditing and controls in data processing (3½ days)

The fundamentals of how to plan and implement an effective DP audit program are demonstrated, including the use of the computer as an audit tool.

Learn to manage people and systems.

These ISMI courses teach DP managers and potential managers the skills to provide effective leadership with people as well as how to utilize available resources to meet present and long-range information requirements.

Managing data processing (3½ days)

Intended for middle and upper management in the DP organization, this course teaches managerial skills such as long-range planning, team building, goal setting and analyzing big financial issues.



Project management (3½ days)

New managers in project environments learn leadership in project-team activities, how to

plan and develop projects, estimate, schedule, measure, and control performance, with emphasis on managing people.

DP operations management (4½ days)

Shows newly appointed and potential operations managers the techniques of effective management within DP operations, working with people to better handle current issues such as security audit, job accounting and charge-back, and work-week alternatives.

Financial strategies for DP executive (3½ days)

Teaches DP executives the financial effects of major DP acquisitions. Concentrates on three key areas: corporate financial considerations, analysis of lease/rent/buy alternatives, and a comprehensive study of types of leases.

Simplify management systems.

This series of courses is aimed at improving the effectiveness of management systems, including those in the systems communications environment. Their primary goal is to increase systems availability, along with the capability to better respond to end-user requirements.



Management control of DP service (3½ days)

This course teaches the essential controls or systems management processes required to effectively manage the DP environment as a business. These processes are described in terms of the logical decisions and activities that must be performed, the data required to make those decisions, the tools, techniques, and organizational alternatives for implementation.

Problem and change management design (3½ days)

Teaches the requirements for detailed design and implementation of problem and change control processes, including the objectives, functions, coordination, data requirements, and reporting and control procedures vital to delivery of DP services.

Disaster recovery planning (2½ days)

This course demonstrates the techniques needed to identify critical applications and shows how to implement, test and maintain an effective back-up capability—before a major disaster strikes the computer facility.

Auditing and controls in data processing (3½ days)

The fundamentals of how to plan and implement an effective DP audit program are demonstrated, including the use of the computer as an audit tool.

Availability planning and management (3½ days)

Designed for strategy and policy setting management. A business executive's approach to high availability I/S service: when it's justified, who's responsible, what's required to obtain and sustain it.

Service level management (3 days)

The process of planning, budgeting and allocating I/S resources to deliver quality computing services to end users. Key focus: enhance end-user productivity.

Data security planning (3 days)

How to select, implement and administer security controls. Identifying exposures, assessing risk and developing cost-effective procedures against the unauthorized destruction, modification or disclosure of data.

Operations analysis and management control (3½ days)

Experienced operations managers and senior staff in a host environment learn the management skills to establish procedures, develop measurements, and plan bypass and recovery techniques to meet user needs.

Managing data communications systems (3½ days)

Focuses on how to establish effective centralized control in the communications network environment. It details the technological, organizational, and managerial solutions for effective network management.

SNA problem determination workshop (9½ days)

A series of hands-on problem-solving exercises in ISMI's specially equipped laboratory. Uses hardware and software tools to interpret network data to isolate problems. Teaches skills to help reduce problem resolution time and improve end-user availability.

Speed up application development.

ISMI offers a series of specific courses designed to attack and reduce the application backlog. They demonstrate successful techniques to plan and control project priorities, to accelerate project development, and to improve project quality and end-user satisfaction.

Accelerating application development (3 days)

Teaches the tools and techniques needed to improve the quality and rate of application development. The role of proper management in achieving these goals is emphasized.

Project planning and control for users (3 days)

Shows users their role as an integral part of the application development process from requirements and specifications to delivery of the final product. Team attendance with DP professionals is recommended.

Application backlog management (3 days)

Students learn to more accurately understand the user's



1987

IBM Management Education.

requirements, estimate the scope of the job, determine the business case, and assess the risk. Helps to assure proper prioritizing of the application backlog based upon return on investment and other objectives.

Top-down requirements analysis (3 days)

Students learn how to specify systems that meet user needs and how to produce functional specifications that are easy to understand, maintain and implement.

Top-down software design (4½ days)

The use of advanced top-down structural design techniques, in both batch and online environments, to reduce development time and maintenance costs.

Application test and maintenance (4½ days)

How to define and install the policies and techniques that can reduce the cost of test and maintenance procedures, stressing product quality and end-user satisfaction.

Implementing software inspection (3 days)

Learn proven procedures for early detection of errors and inconsistencies in design, code and test plans, with the specific steps required for formal inspections.

Project implementation (4½ days)

Managers, supervisors, and senior DP staffers are taught to assess, develop, and modify a phased project methodology to help finish projects on time, within budget, while meeting user expectations.

Information Center implementation (2½ days)

Shows how to organize, implement, and promote an Information Center to provide highly productive applications directly to the end user, without the need for a lengthy development cycle.

Strategies for solving development problems (3½ days)

Teaches effective strategies for dealing with application development problems. Students develop, evaluate and select solutions to real-life problems and examine their personal styles.



Plan systems that keep on producing.

These ISMI courses teach systems planning methodologies to set long-range goals, schedule activities and measure performance to meet business objectives—without interfering with day-to-day information needs.

Data base administration and design (4½ days)

Presents techniques to design and administer data bases for an integrated shared-data environment. It also explores and defines the organizational impact of such environments.

Availability planning and management (3½ days)

Designed for strategy and policy setting management. A business executive's approach to high availability I/S service: when it's justified, who's responsible, what's required to obtain and sustain it.

Information systems planning (3½ days)

Designed for attendance by DP managers, end users, and top management; this course demonstrates a methodology for successful long-

range planning: how to identify needs based upon business priorities, and how to design and maintain a long-range business systems plan.

Capacity planning for managers (3 days)

This course presents the issues and techniques of performance management and capacity planning, together with a methodology for making planning decisions.

Capacity planning and performance (4½ days)

From modeling performance, using queuing formulas, to validation techniques and model refinement, this course teaches the use of tools for critical decisions in capacity planning and performance prediction.

Planning for office systems (3½ days)

Teaches planning for office systems applications integrated with information processing and communications plans to meet user productivity needs.

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Expands WP Capabilities

Interface Ties to Top Communications Nets

MOUNTAIN VIEW, Calif. — A telecommunications interface that reportedly can interconnect any standard word processor or personal computer with the three major domestic and international business communications networks — Telex, TWX and Bell system direct-distance dialing (DDD) — has been unveiled here by Chat Communications.

The Chat II also can create more than 20 office network configura-

tions with dissimilar equipment by adding a series of options, the vendor said. The product has an expandable memory and a printer port, making it possible for small businesses or branch offices to expand word processing capabilities to include a variety of communications.

With the addition of the disk drive/controller option with Digital Research, Inc.'s CP/M, the Chat II can also convert a standard nonintelli-

gent terminal to a limited small business computer that can double as a word processor and also send and receive messages of the communications networks.

The typical configuration for Chat II includes an interface with the user's word processor or terminal, a Bell system DDD interface, a Telex/TWX interface, a printer port and a 16K-byte static random-access memory with battery backup. The cost for such a system is \$1,645, according to Chat Communications, located at 2438 Wyandotte St., Mountain View, Calif. 94043.

Two Stat Muxes
Fit Intertel's
90/10, 90/15

ANDOVER, Mass. — Intertel, Inc. has introduced two statistical multiplexers said to be compatible with the company's recently announced 90/10 Network Control and Management System and the 90/15 Performance Measurement System.

The multiplexers, the first in the company's Network Efficiency Series (NES), were designed to enhance system support capabilities, incorporating flexibility, port switching and selection and contention features. Both units reportedly replace lower-speed data lines and modems with one high-speed data link and an associated modem pair, resulting in lower telephone and low-speed modem costs.

Available as basic four-channel units with one data link, the NES9100 and NES9200 can be incremented with four-channel modules to concentrate up to 32 lines into a single high-speed data link, according to the vendor. An optional backup data link is also available.

Suggested list price for the NES9100 statistical multiplexer is \$2,550, and the unit price for the NES9200 switching statistical multiplexer is \$3,050. Both products are available immediately, according to Intertel at 6 Shattuck Road, Andover, Mass. 01810.

'Comm 2000' Has
Modem Support

BURLINGTON, Mass. — Computer Devices, Inc. (CDI) has introduced a printing-message communications terminal with built-in store and forward, TWX interface, RS-232C interface and 4K-byte battery-protected random-access memory.

The Comm 2000 is a high-speed printer terminal said to feature several levels of communications modem support. The terminal offers 160 char./sec bidirectional printing; selectable 80/132 col format; six user-definable function keys; user-definable tabs and margins; optional high-resolution, dot-addressable plotter graphics; and a command mode to set terminal configurations.

The terminals are available for \$1,685 from CDI, 25 North Ave., Burlington, Mass. 01803.

CRT Terminal
Links to 'Hinet'

OAKLAND, Calif. — Digital Microsystems, Inc. has introduced a dual-orientation CRT workstation that can be incorporated into the company's Hinet local-area network.

The System 5000, which can be configured in either an 8-bit or 16-bit version, provides a full-page CRT screen with black-and-white graphics capabilities. Mountable in a vertical or horizontal position, the 15-in. screen can feature vertically 80 char. by 66 lines or, horizontally, either 80 col by 26 lines or 132 col by 50 lines, according to the vendor.

The 8-bit version starts at \$3,295 and the 16-bit version at \$4,195 from Digital Microsystems, 1840 Embarcadero, Oakland, Calif. 94606.

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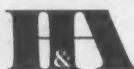
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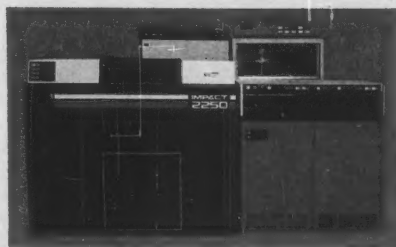
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IBM 3890s Offer Banks Check Service

RYE, N.Y. — Two models of the IBM 3890 document processor that offer a range of check-processing capabilities to medium-size financial institutions were announced here recently by IBM.

Banks with medium-volume item-processing requirements can use the 3890s to read and sort magnetic ink character recognition encoded documents. With its standard microfilm feature, items are automatically microfilmed.

The document processors are available with 18 to 36 sorting pockets. The rated speed of operation goes up to 1,680 6-in. documents (such as checks) per minute, the vendor said.

First shipments of the new 3890s will begin in the first quarter of 1983, with prices starting at \$350,960. Further details are available from IBM's Information Systems Group at 900 King St., Rye, N.Y. 10573.

Laser Printer Houses 68000

CHATSWORTH, Calif. — A laser graphics printer featuring an embedded controller that contains a Motorola, Inc. 68000 microprocessor and 1M byte of random-access memory is available from Symbolics, Inc.

The LGP-1 reportedly features high-resolution graphics of 480 dot/in. horizontal by 240 dot/in. vertical.

The unit has a standard RS-232C serial line interface. As a line printer, it has the standard 8-bit parallel interface compatible with Centronics Data Computer Corp. line printers.

Printing at 10 page/min or 660 line/min in line printer mode, the LGP-1 costs \$24,950 from Symbolics, 9600 DeSoto Ave., Chatsworth, Calif. 91311.

Microdata Unveils Three-Unit Line Of Distributed Processing Systems

IRVINE, Calif. — Microdata Corp. has announced the Sovereign Series 7000, a line of modular distributed processing systems aimed at high-speed data entry and business applications.

Features of the three-model line include:

- File processors to access and maintain on-line disk files, archival files and operating software.

- Keystation processors to control data entry and real-time validation, calculation or look-up capabilities.

- Processing terminals for batch and interactive applications, local inquiries and reporting, system control and user program development and maintenance.

Series 7000 processing terminals are equipped with communications processors that control transmission and receipt of data between remote mainframes and other computer systems. Batch emulation software is available for IBM 2780, 2770, 3741 and Hasp workstations.

In addition, the processing terminals can emulate IBM 3277 terminals and can be switched from local Sovereign mode to an on-line 3270 mode to an IBM mainframe, the vendor said.

Top of the Line

The top-of-the-line Series 7000 system is the Model 7920 distributed data processing system. It offers a file processor, a 70M-byte disk drive, a streaming tape unit, an information processor with communications capabilities and one information terminal. A 150 line/min printer and a keystation processor is also included for the basic purchase price of \$83,790.

The Model 7930 is a distributed data entry system that includes a 30M-byte disk drive, streaming tape unit, keystation processor, 150 line/min printer,



This picture of the Sovereign system shows the file processor housing disk and tape streamer, a programming processing terminal for local batch and interactive routine and the keystation processor with data entry and inquiry terminal.

streaming tape drive, processing terminal and communications interface. The unit costs \$72,290, the vendor said.

A multifunction distributed processor, the Model 7940, was designed for applications without a data entry requirement. The basic configuration includes a file processor, 150 line/min printer, information terminal and communications interface. The unit costs \$75,000.

All three units' disk capacity can be expanded to a maximum of 250M bytes. A second tape drive reportedly can be added and operated concurrently with the inboard streaming unit.

A total of 16 processing units, in addition to the file processor, can be connected to the system, a Microdata spokesman noted.

The Series 7000 can support up to six information and keystation processors and a maximum of 58 CRT units. Up to 48 information terminals and keystations can be on-line in

conjunction with 10 processing terminals. Each is directly connected to a data way, the vendor said.

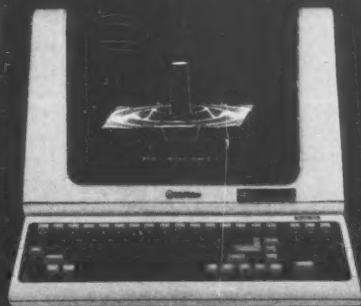
A high-performance keystation processor that supports up to 16 keystations can be ordered instead of the standard keystation processor. In addition, 300 or 600 line/min printers can be substituted for the standard 150 line/min printer, and the standard communications interface can be replaced with an IBM Systems Network Architecture interface, the spokesman said.

Three optional software packages are available for the Series 7000 systems. A Cobol compiler costs \$95/mo, a Cobol runtime package costs \$35/mo and a word processing package is available for \$150/mo.

The Model 7930 is currently available for delivery. The Models 7920 and 7940 will be available in July, Microdata said from 17481 Red Hill Ave., Irvine, Calif. 92714.

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Gains Backup Feature

Model 6330 Tape Drive Enhanced

FORT LAUDERDALE, Fla. — Harris Corp. has enhanced the Model 6330 streaming magnetic tape drive to support file-oriented disk backup at 100 in./sec.

Trilog Printers Released; Boast Twin Print Heads

IRVINE, Calif. — A family of line printers has been introduced here by Trilog, Inc. that reportedly ensures uninterrupted printer operation because of a unique twin print head design.

Trilog's nonstop printing feature is standard with the company's TIP-300 line printer, which prints at 300 line/min. The new feature may also be added to the company's single print head, 150 line/min TIP-150, which is field-upgradable to the Model 300 configuration.

The addition of a second print head to the TIP-150 doubles print speed while providing for the nonstop printing feature, a Trilog spokesman said.

The TIP-300 is priced at \$4,900, and the TIP-150 lists for \$3,900. User cost of upgrading the TIP-150 to the Model 300 configuration is approximately \$1,500. Trilog is based at 17391 Murphy Ave., Irvine, Calif. 92714.

Printer Works At High Speed

MILFORD, N.H. — Integral Data Systems, Inc. has announced a dot-matrix daisy-wheel printer that promises high-quality printing at high speeds.

The Microprism printer features the company's Dot-plot graphics, RS-232 and Centronics Data Computer Corp.-compatible parallel interface, automatic line buffering with 1400 bytes standard, 75 char./sec in correspondence-quality and 110 char./sec in high-speed data mode, according to the vendor.

This printer is priced at \$799. Integral Data Systems is located in Milford, N.H. 03055.

Cleaner Offered

CHATSWORTH, Calif. — A 400-in./sec magnetic tape cleaner/inspector is available from Data Devices International, Inc.

According to the vendor, the Mark 400 was designed for volume multishift DP centers. The cleaner/inspector costs \$4,695.

Data Devices International is headquartered at 20235 Bahama St., Chatsworth, Calif. 91311.

Since the drive is file-oriented, tape capacity varies with the size of the files. For example, 30M bytes of data can be transferred to the unit in about five minutes if the file size averages 16K.

Actual throughput depends on the level of additional CPU and I/O activity occurring during backup as well as the size and physical layout of the disk files, the vendor

said.

The Model 6330, manufactured for Harris by Cipher Data Products, Inc., costs \$9,800 with 1,600 bit/in. density and a controller for up to four drives. The enhancements are available to users as a no charge option, Harris said from 2101 W. Cypress Creel Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Laser Printer Introduced

SAN DIEGO — Datagraphix, Inc. has unveiled a high-speed, off-line printer designed to accept print data sets on magnetic tape from a range of host computers.

The Model 9820 laser printer reportedly can print output from most medium- to large-scale computers from IBM, Burroughs Corp., NCR Corp., Honeywell, Inc. and Sperry Univac.

The 9820 operates at speeds up to 21,000 line/min and can print combinations of page formats of 6-, 8- or 12 line/in. and 10-, 12- or 15 char./in. The user can select character styles from 34 standard fonts; any four fonts can be intermixed within a report.

The printer costs \$300,000 from Datagraphix, P.O. Box 82449, San Diego, Calif. 92138.



GE 2120 printers reduce time-sharing costs.

In time-sharing, every minute your printer spends on-line costs you money. That's why a lot of people are taking the time now to look at the GE 2120 printer.

The GE 2120 will print at a sustained 150 cps and provides transmission speeds from 110 to 9600 baud. It has an optional 32K Text Editor which allows you to work off-line to reduce on-line time and communication charges as much as 70%.

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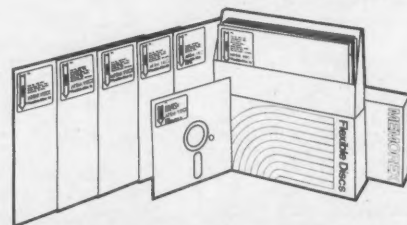
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To Halt Rising Expenses

Lab Takes Billing In-House With Micro

CUYAHOGA FALLS, Ohio — Increased productivity, improved cash flow and a halt to rising billing expenses could be the benefits of using any minicomputer or small business computer system. However, a small medical laboratory here has realized all of this and more by using a two-terminal microcomputer system.

The system — an Altos Computer Systems, Inc. 8000 — is being used to bill patients, generate insurance forms, produce status reports and answer client queries from about 85 physicians in the Akron, Ohio, area. It has been in use since January 1980.

Suburban Medical Laboratory, which owns the computer, is a 26-employee business that was launched about seven years ago by Dr. Sandra Fishel. The lab not only provides services to area doctors, but has also taken part in joint research with nearby Kent State University. In fact, business is so good that Fishel recently opened a second lab employing eight people in neighboring Canton.

Before taking its computing in-house, the lab operated with a service bureau. Each day, it would send data sheets listing all charges and services rendered, together with payments received. The bureau, in turn, billed monthly.

Expensive Proposition

However, having someone else provide the data processing became expensive, Fishel explained.

"We were paying 50 cents per bill — that's \$900 per month — for them to do the processing. Even including the postage, that was a significant expense to us," she said.

Suburban Medical decided to buy a microcomputer system, both because their needs were not great enough to warrant a large minicomputer, and it found a medically oriented system designed by Ohio Micro Systems of Kent. The system, based on an Altos 8000, is called the MED2000. It has 208K bytes of random-access memory, two terminals and letter-quality and dot matrix printers.

The system not only handles the billing,



Dr. Sandra Fishel (standing), owner of Suburban Medical Laboratory, reviews the monthly transaction report with office manager Sandy Nicol.

but reportedly helps the lab respond more efficiently to client needs. For example, the lab used to be inundated with monthly calls from patients who had paid off their accounts but were still being billed. This was due to the time lag between the time the service bureau received the bill invoices and the time the bills were actually sent, Fishel said.

Now the delay has been virtually eliminated, records are kept current to within a day and bills can be generated at any time, she explained. Insurance forms were another bottleneck. Ninety percent of Suburban Medical's patients are covered by insurance, but the service bureau could not handle the paperwork.

"That meant we had a three-week back-

log before the secretaries could get a form prepared and sent," Fishel stated.

Now the same data used to generate billing is also incorporated in an insurance routine. The paperwork usually goes out within 24 hours.

Since 1980, Suburban Medical has made changes to the Altos system to keep up with its growing business. The system originally had a single floppy disk drive, but was later upgraded to a dual-floppy and later a hard-disk system. The firm now has 20M bytes of Winchester disk storage and 512K bytes of floppy disk backup. The system operates under Microsoft, Inc.'s Basic and also has word processing capabilities to handle form and frequently sent letters, Fishel said.

Mini Bits

Matrix Printer Features 80-Col Printing

WINDSOR LOCKS, Conn. — HI-G, Inc. has introduced a dot matrix printer, the 9/80PSF, that reportedly features an 80-col model designed for the requirements of form printing.

Printing characteristics include 150 char./sec, bidirectional, logic seeking, 9- by 9-in. matrix, RS-232C serial or current loop interfaces and a 3,422-char. buffer.

With its graphics capability, the printer can create oversized character presentations without a second pass or added programming, the vendor said.

The printer is available for \$995 from HI-G, 580 Spring St., Windsor Locks, Conn. 06096.

TFC Offers Guarantee On Its Business System

LOS ANGELES — TRW-Fujitsu Co. (TFC) has announced a

guarantee for its small business computer to ensure full-time availability of the system.

Called the 100% Uptime Guarantee, the program promises users of the TFC 8500 small business system free maintenance if there is any interruption of operations because of a system failure. It covers malfunctions in the CPU, memory, fixed disk and console components.

Further details are available from TFC at 9841 Airport Blvd., No. 620, Los Angeles, Calif. 90045.

Processor Offers 68000, Z80A on One Board

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has introduced the Dual Processor Unit incorporating both a Motorola, Inc. 68000 processor and a Zilog, Inc. Z80A processor on a single S-100 board.

According to a Cromemco spokesman, this combination

provides larger memory capacity and faster operation, while enabling utilization of 68000-based software without sacrificing compatibility with Z80-based software.

The Dual Processor Unit is priced at \$995, and the vendor is based at 280 Bernardo Ave., Mountain View, Calif. 94043.

Power Supply Products Fit Mini, Micro Systems

ANAHEIM, Calif. — A line of uninterruptible power supply products for mini and microcomputer-based systems has been introduced here by General Power Systems (GPS).

These products, which come with a standard battery, reportedly eliminate problems caused by common and transverse mode noise, transient conditions, frequency shifts, over/under voltage and complete loss of power for up to 10 minutes, the vendor said. The GPS-

906 and GPS-2006 are rated at 90W and 200W, respectively. Single-unit prices are \$395 for the GPS-906 and \$695 for the GPS-2006.

GPS is at 1400 N. Baxter St., Anaheim, Calif. 92806.

Memory Expander Fits IBM Personal Computer

DENISON, Texas — DG Electronic Developments Co. has introduced a memory board expander for the IBM Personal Computer.

Magic RAM reportedly allows expansion of the IBM random-access memory (RAM) capacity from 64K bytes to 256K bytes, in 64K-byte increments.

The 64K-byte board is priced at \$399 with the 256K-byte board priced at \$939. Boards are available with instruction manuals from DG Electronic Developments, 700 S. Armstrong, Denison, Texas, 75020.

Micro Features Built-In Winnie

ANN ARBOR, Mich. — A small business-oriented 8-bit microcomputer featuring a built-in Winchester disk drive has been developed by Barrington International Corp.

The E'Lite's 5¼-in. Winchester disk drive from Irwin International offers 10M bytes of formatted capacity and access time in the mid-30 msec. range. The system uses the Zilog, Inc. Z80B processor and features 64K bytes of random-access memory. The system's 8-bit microprocessor allows users to take advantage of packaged software now available for Digital Research, Inc. CP/M-based systems.

The E'Lite costs \$7,995 from the vendor at Suite 4, 738 Airport Blvd., Ann Arbor, Mich. 48104.

Array Processor For 68000

LOWELL, Mass. — Sky Computers, Inc. has announced an array processor for microcomputers based on the Motorola, Inc. 68000 microprocessor.

Aimed at scientific, engineering and graphics applications, the Skymnk-V processor features 1M-byte floating-point operations/sec, 32-bit floating arithmetic with an IEEE standard format, 48-bit extended precision for selected operations and the ability to share memory with a host, the vendor said.

The unit costs \$5,990, the vendor said from the Foot of John St., Lowell, Mass. 01852.

Latest Rair 'Black Box' Micro Boasts 70% Faster Operation

SANTA CLARA, Calif. — Rair Computer Corp. has unveiled the latest of its "Black Box" line of microcomputer systems, said to offer an operating speed nearly 70% faster than its previous top-of-the-line system.

The Model 3/50, which reportedly can accommodate up to 1M byte of random-access memory (RAM), incorporates integral 20M-byte Winchester and 1M-byte floppy disk drives. The unit uses 64K-byte dynamic RAMs, incorporated into a 256K-byte MOS memory board.

Eight serial RS-232C ports and an IEEE-488 bus adapter are included as standard interface equipment. The

3/50 runs under Rair's multiuser MP/M II operating system.

A system with 256K bytes of memory costs \$9,500 and each additional 256K bytes of memory costs \$2,500 from 4101 Burton Drive, Santa Clara, Calif. 95050.

PM Series Gets Price Reduction

SAN JOSE, Calif. — Piceon, Inc. has announced a 25% price reduction on its Models PM-1000 and PM-2000 series stand-alone workstation. The workstations function as intelligent terminals and incorporate a full-page screen, 15-in. CRT, displaying 80 char. by 66 lines.

The PM-Series, Model PM-1012 now costs \$7,449, down from \$9,987. The Model PM-1013 configuration adds 256K-byte random-access memory (RAM) option and lists for \$7,995, down from \$10,673. The Model 1023 incorporates a 10M-byte hard disk and one 8-in. floppy drive with a 256K-byte RAM and sells for \$13,995, down from \$16,625.

More information is available from Piceon, Inc., 2045 Lundy Ave., San Jose, Calif. 95131.

UP-9705 Offers 5M Bytes Storage

SUNNYVALE, Calif. — United Peripherals, Inc. has introduced a Universal Winchester Mass Storage Subsystem designed to offer hard disk data storage to a number of personal and business microcomputers.

The UP-9705 reportedly provides 5M bytes of on-line mass storage, equivalent to the capacity of four double-sided, double-density 8-in. floppy disks. The subsystem has an average access time of 170 msec.

The unit is currently compatible with Apple Computer, Inc.'s Apple II; IBM's Personal Computer; and S-100-based systems and features Q-bus and multibus host adapters. The UP-9705 costs \$2,995 with quantity discounts available from 432 Lakeside Drive, Sunnyvale, Calif. 94086.

Micro Board Boasts 16-Bit Capability

OAKLAND AIRPORT, Calif. — An Intel Corp. 8086/8087-based microprocessor board reportedly providing 16-bit capability with provisions for adding a mathematics co-processor and operating system firmware has been introduced by Compupro Systems, Inc.

Compatible with IEEE 696/S-100 standards, CPU 86/87 is said to be available in either 8MHz or 10MHz microprocessor versions. Accommodating 8- or 16-bit words, its on-board logic can read or write 2 bytes serially for 8-bit applications, or pass worldwide values for 16-bit operation.

The price for the 8MHz version is \$695 and for the 10MHz version, \$850. Compupro is located at Oakland Airport, Calif. 94614.

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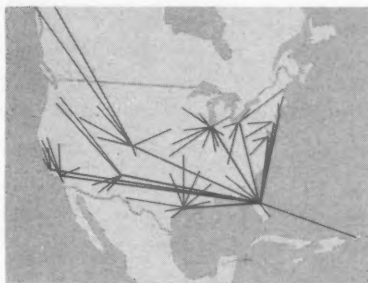
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| Self Help Command Mode | Yes | No | Start-up Manual is built in. Step-by-step prompting permits terminal configuration for individual applications. |
| Built in 300/1200 acoustic coupler | Yes | Yes | Cuts telecommunications costs; flexible access to any data base, from any telephone. |
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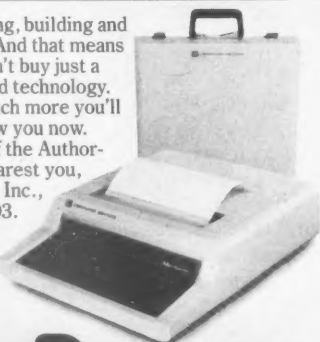
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Ansi Winchester Subsystem Allows Expanded Memory

CHAMPAIGN, Ill. — Central Data Corp. has introduced an Ansi Winchester Subsystem that is said to allow the user to add from 8.9M to 102.9M bytes of Winchester disk memory to any Multibus system.

The subsystem includes the company's Ansi Winchester Disk Controller and either one or two 3M-byte Winchester disk drives. Three different drive capacities can

be integrated into the subsystem, depending on the total cabinet capacity desired, the vendor said. When the disk drives and the controller board are ordered together, complete cabling and connectors are provided.

Single-unit pricing for the 60M-byte subsystem is \$8,785 with the controller from Central Data, 1602 Newton Drive, Champaign, Ill. 61820.

Disk/Tape Combo Out

HUNTINGTON BEACH, Calif. — Cybernetics, Inc. has introduced the Cyberdrive — a Winchester disk/cartridge tape combination designed for the IBM Personal Computer. It is said to offer 13.5M or 27M bytes of disk capacity in a single cabinet with an integrated mini-cartridge tape for secure data backup.

The usual 5M-byte stepper motor Winchester disk offers seek times typically in the range of 100 msec to 200 msec, but this unit is said to have an average seek time of 33 msec.

The unit's price starts at \$5,750, available from Cybernetics, Suite 208, 8041 Newman Ave., Huntington Beach, Calif. 92647.

Controller Interfaces to LSI

ANAHEIM, Calif. — Sigma Information Systems has introduced the SDC-RLV22, a dual-wide controller for 5¼-in. Winchester drives. Among the subsystems it interfaces to is the Digital Equipment Corp. RL01/RL02 disk subsystem.

It is also pin-to-pin and sig-

nal-compatible and power-compatible with Q-bus backplanes that support DEC LSI-11 series CPUs. It plugs directly into any LSI-11 backplane slot.

The controller is available for \$915 from Sigma Information Systems, 6505 Serrano Ave., Anaheim, Calif.

MFE Unveils Tape System

SALEM, N.H. — MFE Corp. has announced a digital tape cassette system that provides backup for 5¼-in. Winchester disk subsystems.

Called the MFE Companion series, the unit is capable of

storing up to 10M bytes in four minutes on a single cassette tape.

A 5M-byte unit costs \$995 and a 10M-byte unit costs \$1,175 from Keewaydin Drive, Salem, N.H. 03079.

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9 to 5 Warns Congress: OA Poses Threat To Clerical Workers; Calls for Action

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Despite the heady claims of office automation vendors, computerization may well mean the future will be worse than the present for this country's millions of clerical workers, a congressional labor subcommittee was told recently.

"American management's idea of the 'office of the future' means little more than a recreation of the factory of the past," Judith Gregory, representing the 9 to 5 National Association of Working Women, told the Labor Standards Subcommittee recently. Gregory called for prompt congressional action to ameliorate the effects of office automation before "irreparable harm is done to office workers' jobs, health and quality of working life.

"Today's office workers find themselves threatened with many of the same processes of 'job degradation,' which undermined the skills and dignity of an earlier generation of industrial workers," she said.

"Without conscious and concerted interventions by concerned policy makers and employers, labor unions and office workers themselves, we risk societywide dangers and we will lose important opportunities to use new technology to address age-old problems that plague women's work today — problems of low pay, job segregation, dead-end jobs and discriminatory employment practices."

Gregory described for the subcommittee what she called the "five great dangers" of the computer age:

(Continued on Page 68)

Instead of Key Word Systems Text Retrieval Called Viable Alternative

By Bruce Hoard

CW Staff

FRAMINGHAM, Mass. — Text retrieval systems allow users to retrieve mentions of particular words even though those words have not previously been identified as key words, explained Molly Upton, editor of the International Data Corp. publication, *Office Automation Reporting Service* (Oars).

Upton noted that text retrieval systems have become more viable as a result of technological advances and the price/performance improvements they engender. "For example, the price of a megabyte of disk storage has dropped 99.5% over the past 24 years," she said.

Despite the large advantage full-text retrieval systems enjoy over key word systems, which only fetch pre-entered key words or summaries on particular documents, the Oars editor expressed surprise at the relative scarcity of systems.

There are currently two major categories of systems, fixed storage and alterable storage.

This is the fourth in a series of articles on office automation technologies. Next week, a look at optical character recognition.

Fixed storage includes use of microfilm, microfiche and image storage such as current optical disks, Upton said. The alterable storage is comprised of digital storage systems.

The two categories in turn employ two technical means of retrieval, inverted file and scanning of the entire text, usually with a hardware assist.

Products are available in several forms:

- Discrete software for mainframes.
- Turnkey systems.
- Bundled software with other office automation features.
- Services firms.

Most computer systems operate on the inverted file concept and form a list of every word used; each word has a tag as to its location within the text. The

advantage is that it is a software implementation and can be done on various existing computers. On the negative side, it is often difficult to update such a system on-line, she declared.

With the hardware-assisted full-text scanning method, logic and storage are generally packaged in one unit dedicated to text retrieval. The text is compressed via an algorithm and the system performs searches through the whole text at a fast speed, she said, noting, "Adding new items is easily handled by the system as they can be appended into the end of the file."

The requested items or their locations will appear on the screen as the system is working, thus avoiding the possible user frustration of having to wait until the search is complete, as is the case with the inverted file approach, Upton said.

For users with divergent systems, black boxes — or protocol conversion units — are now available to enable text created on one system to be accepted by

and look the same on another system. The need for these devices arises because nearly every vendor uses a different set of codes internal to its product to indicate such features as paragraphs, center and indent commands, she said.

Some protocol converter vendors are Rascal Telesystems, Inc., Chicago; Shaffstall Systems Co., Indianapolis; and G.O. Graphics, Inc., Lexington, Mass.

Other Facilities

Most of the specialized text retrieval software currently available is for large time-sharing DP systems serving several users, either on a commercial or in-house basis, she observed. However, there are a few dedicated text applications units such as the Burroughs Corp. Ofisfile. In addition, Wang Laboratories, Inc. and Datapoint Corp. have integrated facilities in their software arsenals.

Prices of text retrieval systems can range from a free feature — bundled in with other software — to \$60,000 for a special hardware unit and software to as much as \$200,000 for a software package. Most software packages run in the \$40,000 to \$80,000 range, she said.

Vendors include Datapoint and Wang. Two time-sharing companies offering the capability include TSI International in Norwalk, Conn., and Battelle Columbus Laboratories, Columbus, Ohio.

Features 630K-Byte Capacity

Entry-Level Word Processor Debuts

TORRANCE, Calif. — Cado Systems Corp. has unveiled an entry-level word processor said to incorporate a full range of document-oriented text handling and formatting features including column manipulation, file creation and horizontal scrolling.

The desktop Cado Cat Writer features a CRT screen/key-board, processor with 96K bytes of memory, an 8-in. single-sided diskette with a 630K-byte capacity, complete word processing software and computer-aided tutorials, which reportedly teach users how to operate the word processor.

Users may select any of a wide range of compatible word processing printers for use with the device, the vendor said.

Cado is offering NEC Information Systems, Inc. 20-, 35-

and 55 char./sec word processing printers.

The two-port Cat Writer can be expanded, via the addition of a single circuit board, into a four-port system capable of ac-

commodating four terminals, printers or communications lines.

A basic system costs \$5,490, Cado said from 2771 Toledo St., Torrance, Calif. 90503.

Datavox-One Boasts Multifunctions

MERRIMACK, N.H. — Datavox Communications, Inc. has unveiled a multifunction deskset that reportedly operates as an IBM 3270-compatible CRT terminal, as an Ascii Teletype-writer printer terminal and as an electronic feature phone.

The Datavox-One was designed to be used by corporate professionals as a single workstation that allows access to voice and data information at the touch of a button. It is equally compatible with private branch exchange telephone or

computer terminal communications.

The device operates as part of a cluster attached to the Datavox controller. The deskset reportedly can display data as either a Systems Network Architecture or Binary Synchronous Communications device emulating an IBM 3278-2 terminal handling two-way communications with a host computer.

The controller emulates an IBM 3274 Model 51C and operates at speeds from 2,400 to

9,600 bit/sec, to support up to eight desksets or optional printers at cable distances up to 5,000 feet.

Datavox-One can be used as a dial-up Ascii terminal using an external modem or acoustic coupler to access a host computer at speeds up to 1,200 bit/sec.

Prices for it begin at \$1,995; the Datavox controller is \$2,495 and the asynchronous Ascii option is \$1,495. Datavox said from 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

Simplified Mainframe-Based E-Mail Debuts

KANSAS CITY, Mo. — Applied Data Research, Inc. has introduced a mainframe-based electronic mail system that is integrated with the vendor's on-line word processing system, ADR/ETC.

ADR/Email is reportedly easy to use and features simple, English verbs and prompt screens. It sends, receives, stores, retrieves and manages correspondence. It can be operated by administrative personnel — such as vice-presidents, managers and secretaries — who are not trained in DP.

Elements of the system include electronic mailboxes, automatic message routing and broadcasting, correspondence archiving, split-screen editing and viewing capabilities,

hard-copy printing and multiple levels of security. Support will be provided for IBM 3270-type terminals and Teletypewriter dial-up devices.

Correspondence, which is tracked through "in" and "out" boxes simulated on a terminal, is easily generated, filed and delivered within seconds, the vendor claimed. There are no restrictions on the size of correspondence and the sender is automatically notified when the recipient takes action, such as review or acknowledgement, on received mail.

ADR/Email is said to be accessible under ADR's Roscoe, Datacom/DC and IBM's CICS.

The permanent license price for the system starts at \$36,000 for IBM OS/VS environments and \$28,000 for

DOS/VSE environments. Monthly, three- and five-year leases are also available. It will be available in the

third quarter of this year, ADR said from Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540

Group Sounds OA Alarm

(Continued from Page 67)

- The spectre of structural unemployment. "Computer technology... is a labor-reducing technology," she stated, saying the need for clerical workers "appears to be 'masking' the potential job displacement effects of automation in office industries such as insurance and banking."

- The danger of increased sex, race and age discrimination in a polarized work force. Gregory claimed automation might lead to an "increased but

still small number of highly technical jobs at the uppermost levels and a large number of deskilled jobs at the base, with a 'skills gap' between them that becomes harder and harder to bridge."

On discrimination, she noted that women in already computerized fields are "concentrated overwhelmingly in the lower ranks," and stated automation may perpetuate the position of minority women who are "especially concentrated in 'back office' data entry pools, often involving shiftwork." Age discrimination may result from the exclusion of older workers from on-the-job training and retraining programs, she added.

- The danger of degradation of work conditions and increased occupational health risks, especially increased job stress. Gregory noted concerns about CRT terminal health risks and said clerical workers are also threatened by a devaluing and deskilling of office work: "Office automation means working harder and faster, for more people at once, without getting paid better."

She added that "through automation, the enjoyable aspects of clerical work — variety, contact with other people, natural rest breaks and change in routine — are threatened with elimination. The most stressful aspects — repetitive tasks, constant sitting, dead-end jobs, isolation and a relentlessly fast work pace — are on the rise."

- The danger of runaway offices and the dilemma of office homework. She pointed to a trend to perform bulk information processing work outside the country to take advantage of low wages. Domestically, she said, "the history of subcontracted homework for lower level workers is one of employers taking advantage of isolated workers through decreasing piece-rates, reduced benefits and evasion of labor laws."

- Danger of decreased productivity and efficiency and quality and accessibility of services for the general public. "Rigidly computer-controlled office work systems are counterproductive as well as harmful to one's health," Gregory charged.

She said studies show "error rates increased from 40% to 400% when the control over the pace of work is taken away from workers and given over to a machine-controlled system."

WP System Offered For IBM Micro

MONTEREY, Calif. — Lifetree Software, Inc. has announced Release 1.0 of its Volkswriter word processing aid for IBM Personal Computers.

The enhanced package now underlines and boldfaces characters. Text can be proofed before printing and sent to the printer through a serial card if desired.

The package costs \$195, the vendor said from Suite 342, 177 Webster St., Monterey, Calif. 93940.



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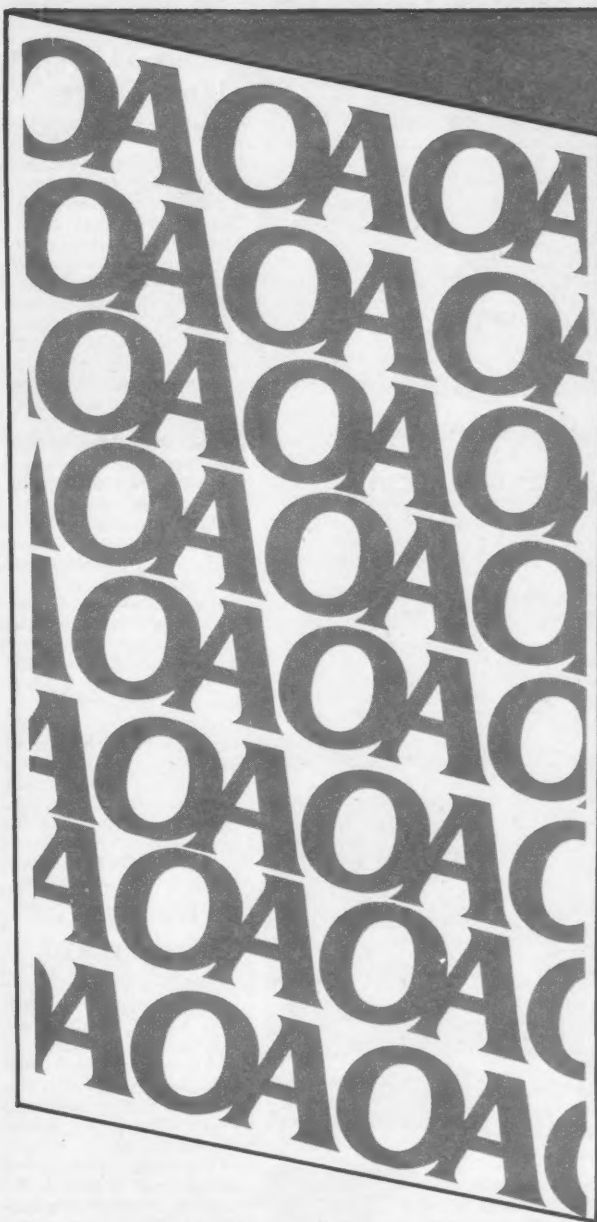
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Coming up in *Computerworld OA*

Selling Office Automation to Your Organization



The next issue of *Computerworld OA* will focus on selling office automation within an organization. This special report will feature the human angle of office automation and highlight the strategies of selling the concept of OA to top management and end-users in an organization. You'll see articles on implementation techniques, feasibility studies, human interface, ergonomics and productivity.

And, of course, you'll see several articles on current happenings in all aspects of OA.

There will be bonus distribution of this issue to attendees of the Info '82 Show in New York this October. So, if you're a supplier of OA products and services, you won't want to miss the opportunity to advertise in *Computerworld OA's* next issue.

The issue date is September 29th. The deadline date to remember is August 20th for space reservations. (Materials are due August 27th.)

For more details on *Computerworld OA* and the people who read it, just contact your local *Computerworld* representative, or call Bob Ziegel, Vice President at (617) 879-0700 for all the information.



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IWP Directory Available Soon

WILLOW GROVE, Pa. — The 1982 edition of the International Information/Word Processing (IWP) Directory of Information/Word Processing Equipment and Services will be released this month by the International Information/Word Processing Association.

The 250-page text includes articles from industry experts as well as product and service data. It covers automated office systems, software, I/O devices, communications, records management and related topics.

The soft-cover edition costs \$20 for IWP members and \$29.95 for nonmembers; the hard-cover edition costs \$45 and \$60, respectively. It can be ordered from Information Clearinghouse, Inc., 500 Fifth Ave., Department IWP, New York, N.Y. 10110.

Communicates With High-Speed Units

Exxon Unveils Fax Transceiver

STAMFORD, Conn. — Exxon Office Systems Co. has unveiled its Model 2310 high-speed facsimile transceiver that reportedly permits communications with high-speed units and most 3- and 6 min/page units. It costs \$6,495.

The company also announced the availability of Digital Research, Inc.'s CP/M operating system, said to

expand the Exxon 500 word processor into a highly versatile personal computer. A 500 user will now have access to a wide range of software packages, which will make it possible to perform functions such as financial analysis and planning, general and time accounting, project and data base management.

The company also an-

nounced expansion of its family of printers to include the Exxon 95 high-speed printer (50 char./sec). The high-speed printer costs \$3,750, Exxon said from 777 Long Ridge Road, Stamford, Conn. 06923.

Telex-11 System Links Office, Telex Network

JAMAICA, N.Y. — Lambart Computing, Inc. has introduced a hardware/software package designed to allow an instant link between the office and Telex Products, Inc.'s Telex network. It is said to allow the user to store messages at a time convenient for the addressee. The message is entered through the keyboard, corrected on the screen and sent directly to Telex lines.

The Telex-11 system allows messages to be sent immediately or stored and allocated on a priority or a time slot for later transmission. Retransmission is handled automatically and if messages fail, they are stored for later manual transmission by the operator, according to the vendor. A log of all Telex transactions is held on disk, allowing monitoring of the nature of Telex traffic.

Total cost for hardware, software and installation, depending on operating system, starts at \$3,800. More information can be obtained from Labart Computing, JFK International Airport, 147-10 181st St., Jamaica, N.Y. 11430.

Attorneys Get Software Aid

HONOLULU — A software package designed for attorneys is available from Advanced Legal Software. The package operates on the IBM Displaywriter, Xerox Corp. 860 and Lanier Business Products, Inc.'s EZ-1, among other machines.

The package includes client billing and full-trust accounting. It reportedly conforms to the standards of the American Bar Association and the Code of Professional Responsibility.

The Advanced Legal Software package provides for different types of fee-arrangement categories — 14 different hourly rates for each attorney; client accounts; professional statements produced in eight user-defined formats; and management and financial reports and summaries.

It costs \$4,900 from Advanced Legal Software at 524 Cooke St., Honolulu, Hawaii 96813.

"We searched for two years for a magnetic tape input to our IBM System/34. It was a tremendous relief to discover that the Mitron STD 1600 gives us that capability."



Kathy Mast
Data Processing Manager
Communications Specialists, Inc.
Printing and Direct Mail Services
Austin, Texas

Communications Specialists, Inc., of Austin, Texas installed the Mitron STD 1600 Data Communications Terminal to give magnetic tape capability to their IBM System/34 in the fall of 1980. Using the Mitron, CSI can directly access magnetic tapes and supply magnetic tape files. You can do the same thing with your IBM System/34.

"With the Mitron I have total control. We can now do it all — without conversion equipment. I can read anything that comes in without the added cost and a two or three day delay using a service bureau," says Kathy Mast. "The Mitron STD 1600 is easy to install through the IBM System/34 communication port. It's so convenient and economical to operate, and of course magnetic tape costs about 1/12th as much to use as diskettes."

You can either lease or purchase the Mitron STD 1600. It is available with 1200' or 2400' reels.

The Mitron STD 1600 can also be used as an off-line, tape-to-tape terminal over the dial-up or private line network.

"We have simplified our production tremendously. And, I've just been elated with the people at Mitron and the way they have worked with us to solve any problems," adds Kathy Mast.

For more information about how you can add a magnetic tape capability to your IBM System/34, call us, TOLL FREE, at 800/638-9665. Or call 301/992-7700.

MITRON

Systems Corporation
2000 Century Plaza
Columbia, Maryland 21044

TRW Sees Future In Micro, Net Services

By Marcia Blumenthal
CW Staff

FAIRFIELD, N.J. — Providing maintenance service for micro-based systems and networks of large end users are new opportunities coming over the horizon for the Customer Service Division of TRW, Inc.

In the past, the estimates of failure rates for micro systems were too high, so TRW, one of the two major national maintenance vendors, did not consider service of low-end systems a moneymaker, explained John T. Harnett, the firm's director of planning and development.

However, these days the reliability of microprocessors and peripherals has vastly improved. Currently, TRW has taken on the micro lines of Vector Graphic, Inc., Cromemco, Inc., Televideo Systems, Inc. and Commodore Business Ma-

chines, Inc. "We are putting together a product menu," Harnett noted during a recent interview. Although the product menu strategy is still in its early stages, advertising by some micro makers is beginning to include a notation that TRW is providing maintenance service for their products.

While Harnett was pleased with this situation, in some cases it can appear to be favoring one vendor, he inferred, noting that because TRW does not sell any products, it aims to be evenhanded with all the vendors it represents.

Nonetheless, when asked whether developing a "product menu" for maintenance would influence users' choice of systems, Harnett replied, "I hope so."

In particular, systems houses,

(Continued on Page 74)

Software Copyright Suit Settled Out of Court By Two DP Vendors

By Lois Paul
CW Staff

MIDDLEBURG HEIGHTS, Ohio — Recognizing the high cost of litigation, two computer firms here recently decided on an out-of-court settlement of a lawsuit that involved copyrights on computer software.

The suit was brought in May by Data Decisions, Inc., a local distributor of Qantel Corp. equipment, against Assured Systems Development, Inc. (ASD) and its president for alleged copyright infringement and misappropriation of trade secrets. The nine counts in the suit reportedly totaled about \$18.5 million in damages.

After four days of intense negotiation, a settlement was

reached in early June which basically involves a distribution of the rights to the software produced during the two firms' six-year association.

ASD abandoned its copyright claims to software it had developed for about 80 customers. Data Decisions and ASD agreed to share the ownership rights to about a dozen software systems that had been developed.

ASD Paid \$70,000

In addition, Data Decisions agreed to pay ASD \$70,000, which was mostly for services that had been received but also included payment for exclusive ownership rights to a financial package in which ASD had invested last fall.

U.S. District Judge John M. Manos encouraged both parties to settle the matter out of court. His first move was to issue a temporary restraining order against ASD on the basis of the allegations that the firm had infringed copyright.

"I really don't think the judge realized he was shutting us down," ASD President William

(Continued on Page 79)

DG to Close Plants for Two Weeks

WESTBORO, Mass. — Data General Corp. will shut down all its production facilities for two weeks starting tomorrow. The plants will be closed for a total of nine working days.

DG said it shut down its plants to lower inventory and adjust to current economic conditions.

The 4,000 employees affected by the closing will not be laid off; they have been given the option of taking vacation time during the shutdown or going without pay for nine days. Employees without enough vacation time to cover the shutdown were allowed to borrow on future vacation time, a spokesman said.

Plants affected by the closing

are production facilities in Westbrook, Maine; Portsmouth, N.H.; Southboro, Mass.; Clayton, N.C.; Apex, N.C.; Austin, Texas and the firm's captive semiconductor facility in Sunnyvale, Calif.

Administrative employees at

the firm's Westboro corporate headquarters were not affected by the shutdown. Additionally, security personnel at the closed plants, as well as some employees working on advanced production and research projects were not affected.

Itel Resolves Claims With Lloyds

SAN FRANCISCO — Itel Corp. has settled all its claims with underwriter Lloyds of London stemming from Itel's former computer leasing and financing business.

As a result of the settlement, all of Itel's material remaining liabilities associated with the

Lloyds program have been eliminated.

Lloyds has withdrawn its claim against Itel's Chapter 11 case for approximately \$100 million.

In addition, Itel has received cash payments of approximately \$4 million from Lloyds and

another \$2 million from an escrow account, Itel said last week.

Late last year, Lloyds and Itel jointly announced the framework for settlement. That agreement was subject to material conditions, which Itel said have been fulfilled.

What's the Best Climate for DP Firms?

• Study Shows Notable Schools, Top Work Force Attract Firms

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Although almost every state is touting its particular quality of life, climate and tax incentives to attract high-technology industries, a new study shows that only those areas with prestigious universities and skilled work forces can expect long-term success in this competition.

The study by the congressional Joint Economic Committee (JEC) found that "the role of the university is important because universities are the major suppliers of technicians, engineers and scientists, and they are a major source of new ideas, upon which high-technology companies so heavily depend to remain competitive."

"Universities also add to

(Continued on Page 80)

• Future of Route 128 Belt Seen Threatened by Academic Ills

By Susan Blakeney
CW Staff

BOSTON — A deterioration in technical academic programs in this area threatens the future of the Route 128 "high-technology belt," a recent study conducted here has found.

A combination of environmental factors is causing the situation, according to the study conducted by Dr. Elizabeth Useem, a faculty associate at Northeastern University here. These factors included school budget cutbacks at every level, the large percentage of math and science teachers planning to leave their professions, the small number of people entering the teaching arena and poor relations between educators and the high-technology industry in general.

The JEC study also noted the importance to high-tech com-

(Continued on Page 80)

(Continued on Page 80)

• Midwest Best Bet for High Tech

WASHINGTON, D.C. — The Midwest offers "the best overall investment climate for the high-technology companies," the congressional Joint Economic Committee (JEC) said in its study on the "Location of High Technology Firms and Regional Economic Development."

The Midwest's "labor markets compared favorably with the high-cost markets in New En-

gland and the Far West. Also, its academic institutions were ranked above academic institutions in the Southeast, Southwest and Mountain and Plains states, and it had fewer low ratings on the other locational attributes (e.g., cost of living and cultural amenities) than the other regions," the study said.

Networking standards.

Nobody keeps your options open like Digital.

By now, everyone understands the need for standard communications protocols. Without them, an electronic Tower of Babel would surely ensue. But there have to be different standards for different networks. A local-area network is different from a wide-area network. A public network is different from a private one.

No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

Our goal is to offer our customers a range of standards to achieve any combination of networking objectives. And we've been pursuing that goal for many years.

A forward-thinking strategy.

When we first developed our networking architecture, we understood the need for flexibility.



We consciously adopted an architectural strategy that would allow our networking software to

work freely with a wide range of protocols, including some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

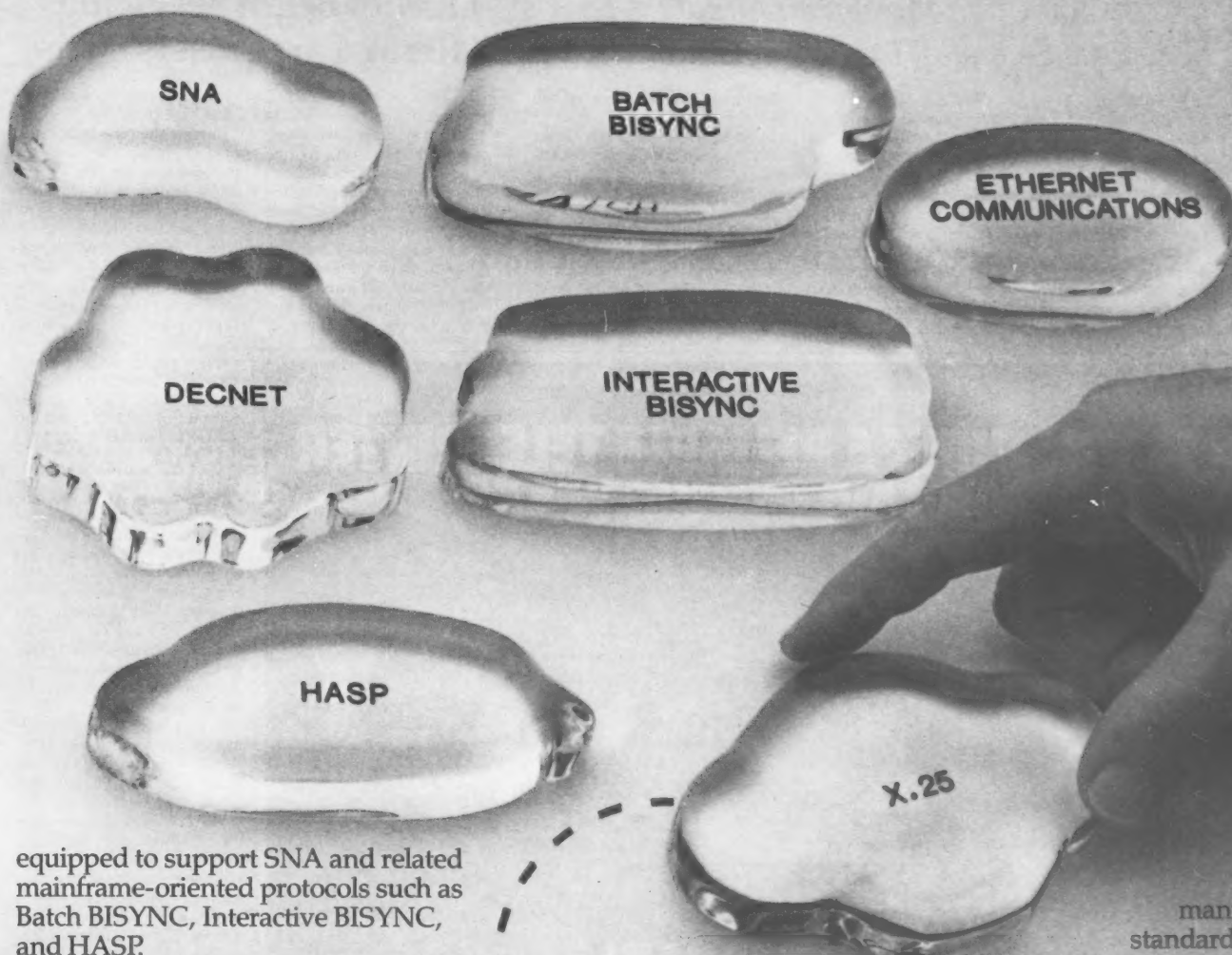
X.25 and other public networks.

Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

But when used with our computers, X.25 is much more than a simple link. We can provide you with the higher-level protocols that will take your systems beyond mere communications and into the sophisticated functionality that has made us a leader in networking software.

Hierarchical networks.

Even though we prefer to implement more flexible distributed networks, we are amply



equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

Digital is one of the original sponsors of the EthernetTM* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

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We have listed a few of the

PROTOCOL

many standards we are currently supporting. There are more.

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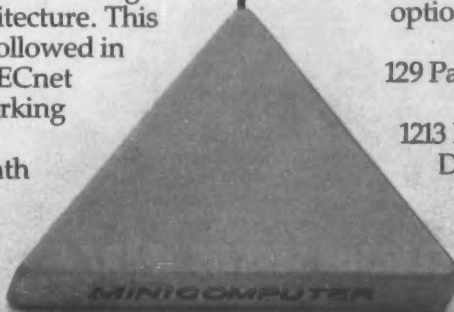
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We change the way
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Top 100 Computer Firms Grew Faster Than the Economy Last Year, Study Shows

STAMFORD, Conn. — The top 100 American computer companies grew four times faster than the economy as a whole last year, according to a study conducted by the Gartner Group, Inc. here.

Gartner's market analysis also showed a 19.38% increase in computer company revenues for 1981, up from \$55.2 million in 1980 to \$65.9 billion. IBM reportedly captured just 38.1% of those revenues, down from 38.75% in 1980.

The fastest growing of all top 100 compa-

nies was Warner Communications, whose DP revenues, spurred by its Atari (Corp.) Division, increased 475% last year. Other companies at the top of the Gartner list are Apple Computer, Inc. and Tandy Corp.

In word processing, according to the report, IBM leaped to the top of the list, based on its introduction of its Displaywriter. Other manufacturers of word processing equipment among the top 100 are Wang Laboratories, Inc., Lanier Business Products, Inc., Xerox Corp. and CPT Corp.

TRW to Begin Servicing Micros, Large Users' Nets

(Continued from Page 1)
retailers and others who put together systems have a special problem with maintenance because "foreign peripherals" are attached to the processor. "In some cases these vendors can't conclude a sale unless they can arrange to have the entire system serviced," Harnett joked, "When I started to explain this to people a couple of

years ago, they looked at me like I had three heads."

Despite the new opportunity, TRW is not taking on the maintenance of the entire micro community. It takes four to six months to evaluate a product before it is selected for maintenance services by TRW. "We look at the machine population and send in armies of technical support people to analyze the system," he said.

After a system is put on TRW's maintenance docket, the company has to train its personnel, spare up and organize the documentation.

Micro Maintenance

Harnett and TRW are betting that maintenance of micro systems will be a money-maker once the volumes are in place. However, he realized not all systems will be winners. The company has already given up on one vendor it thought would be profitable because that vendor's product did not take off on the market.

Besides micros, one of the biggest opportunities TRW sees is servicing equipment from Digital Equipment Corp.

While TRW is most known for maintaining high-end systems, it sees value in providing service for interesting start-up ventures. The firm is working with Pioneer Electronics Corp., a large electronics equipment supplier, on bids to the government for video disk business, Harnett reported.

And the company sees a new opportunity in large contracts with users to service the terminals on their networks. Harnett disclosed the firm is nearing a final arrangement with a large company for maintaining 20,000 terminals.

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CDC, NCR, ICL Get Centronics Stock

HUDSON, N.H. — Control Data Corp. now owns 35% of Centronics Data Computer Corp.'s currently issued and outstanding common stock, it was announced recently. NCR Corp. and International Computers Ltd. (ICL) each own 5% of the stock.

These announcements were made as the result of an agreement among the companies in which CDC purchased 2,325,582 shares of Centronics common stock for \$25 million. Centronics acquired the printer business of Computer Peripherals, Inc. in consideration of the issuance of 2,604,650 shares of Centronics common stock to CDC, NCR and ICL. Thomas G. Kamp, president of CDC's Peripheral Products Division, has become the chairman of Centronics' board of directors under this agreement.

Centronics also announced that it has replaced its existing bank credit agreement with a group of banks. Centronics currently has approximately \$21 million of credit available under this new facility.

Other Moves

Applied Data Research, Inc. declared a 5% stock dividend for all shareholders of record on June 14 payable on June 30. The company's domestic bank line with the Girard Bank of Philadelphia was recently increased from \$5.5 million to \$8 million.

\$\$\$

Management Assistance, Inc. (MAI) reached an agreement with **Continental Telecom, Inc.** to acquire the option to purchase all of the 1,288,200 shares of MAI stock currently held by Continental for \$2.5 million. The option is exercisable at \$16.98 per share between Nov. 15 and Nov. 30.

\$\$\$

Magnetic Controls Co. declared a three-for-two stock split in the form of a 50% stock dividend payable June 23 to shareholders of record June 9. The dividend will increase the outstanding stock to 3,803,699 shares.

\$\$\$

Management Science America, Inc. has made a public offering of 710,000 shares of common stock at \$21.25 per share.

\$\$\$

Lifeboat Associates has received an undisclosed amount of additional funding from Bessemer Venture Partners of New York and Oak Investment Partners of Westport, Conn.

\$\$\$

The Software Authority has obtained \$500,000 in additional funding from Osco Ventures of Menlo Park, Calif.

\$\$\$

Informatics General Corp. common stock has begun trading on the New York Stock Exchange. Approximately 3.4 million shares formerly traded in the over-the-counter market were transferred to the exchange; an additional one million shares are available for stock options.

Over AEA Opposition

House Approves Small Business R&D Act

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The House of Representatives has overwhelmingly approved a bill setting aside a portion of federal research and development funds for small businesses. The measure was strongly opposed by the American Electronics Associations (AEA) as a wasteful intervention of government bureaucracy in the marketplace.

The Small Business Innovation Development Act was passed June 23 by a 353-57 vote after the House agreed to cut the set-aside from the originally proposed 3% to 1.25% of the R&D budgets of the affected federal agencies [CW, May 17]. The total amount

of those agencies' research budgets is estimated at \$40 billion.

The House bill must now go to a conference committee to reconcile differences between it and similar Senate legislation passed last December on a 90-0 vote.

The unanimous approval of the Senate and the House Small Business Committee, which had OKed the legislation 40-0, plus White House support had removed any doubt the bill could be defeated by AEA lobbying against it. The association was joined in its fight by university groups, which feared the bill would divert federal R&D funds from colleges.

Efforts by various House committees to exempt certain federal agen-

cies from the bill's set-aside provision, which would have diluted the effect of the legislation, were not successful.

While acknowledging its defeat in a statement released here, the AEA claimed at least a moral victory. "Although our views did not prevail, we believe our opposition on principle served a useful purpose," AEA Chairman William R. Thurston, president of Genrad, Inc., Concord, Mass., said.

"We have spotlighted the flaws in mandatory set-asides and may have prevented future set-aside legislation from being too quickly and unquestioningly passed," Thurston said.

If you think nothing much has happened in software since our last software *Extra!*, wait 'til you see September's

This September 1st you'll be getting an entire issue of *Extra!* devoted to software — the driving force that's re-shaping the computer marketplace. In 1980, software revenues were \$5,090,000,000. By 1985, International Data Corporation (IDC) predicts that they will reach \$16,885,000,000.

Software is taking an increasingly larger share of EDP budgets. Actual 1981 spending for software was 30% higher than for 1980 — a 5% higher growth in spending than had been planned. And this was in a year when nearly all other spending was less than had been anticipated.

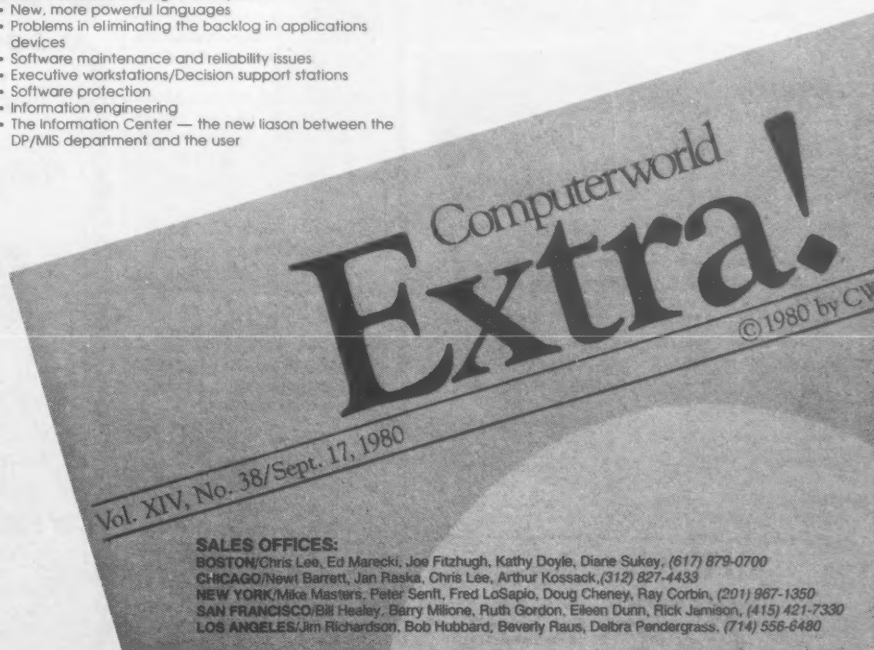
But the real story is not software's increasing importance in EDP budgets, it's the rapidly-changing software environment. And September's *CW Extra!* "The Changing Software Environment" gives you survival techniques and the skills and tools you need to stay involved in the changing flow of information that the new software is generating. Here's just some of what this September 1st software *EXTRA!* will cover for you:

- New Database Management systems
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If you sell to Vice Presidents, Directors, DP Managers and other MIS professionals, here's where you'll find your buyers this September 1st. *Computerworld Extra!* will be read by more than half-a-million computer-involved readers including 116,988 paid subscribers, (ABC 12/31/81) and 423,720 pass-along readers (Becker Research Corporation).

CW Extra! advertising close is July 23 and we'll be glad to give you more advertising information — as well as complete details on our subscribers and readers. Just contact your local *Computerworld* sales office, or, call Frank Collins, Display Advertising Manager, *CW Communications, Inc.* at (800) 343-6474. In Massachusetts call (617) 879-0700.



DP Industry Seen Facing Threefold Challenge

By Marcia Blumenthal

CW Staff

COPENHAGEN, Denmark — The vendors that will be successful in the future are those that are "aware the user is more educated in the technology, but more skeptical because of past bad experiences," observed Carlo de Benedetti, vice-chairman and chief executive officer of Olivetti.

Telling delegates to the recent Third Annual World Computing Services Industry Congress here that the

computer industry must make strides in how it treats the human factor, de Benedetti noted that the personal computer has extended the knowledge of applications and more people are becoming accustomed to the technology. The end result, he said, is that the computer will become the most important tool in the work environment.

The challenge the industry faces is threefold, according to de Benedetti. First, it must establish standards through-

out different segments of the industry without creating interdependence among manufacturers or constraints on innovation. Standards, for example, are required for programs that run on various personal computers.

Moreover, to achieve the larger manufacturing volumes needed to meet the demand for such systems, vendors must develop standards that make the user's purchasing decision easier.

Interfaces represent the second challenge to the industry. Systems must take the initiative and drive the operator by imposing its language in a clear way, de Benedetti said.

The third challenge lies in the software arena, where vendors must improve the quality of software products and begin to adopt components of artificial intelligence.

Government Role

Turning to the role of government, de Benedetti said governmental authorities must better understand the role they play in information processing. Government should not put money into "inefficient or money-losing operations."

Instead, government should create an "infrastructure for the industry," as it did in creating a highway network to facilitate the

automobile industry, de Benedetti explained. Government could create a better telecommunications infrastructure by lowering the cost of data transmission.

The public sector should also improve the education process, creating a "computer culture." And, finally, it should support the research and development activities of successful industries such as information processing.

In terms of the industry, de Benedetti sees major consolidations occurring during this decade. The decline in the profitability of U.S. and European firms shows that the information processing industry has a problem with efficiency, he said.

"The industry must take greater care to offer the user practical solutions, not fu-

ture dreams," he said. One example of this is local networks that are needed, but which today do not produce substantial revenues for vendors.

Industry leaders must recognize that the nature of the computer industry is becoming much more global, de Benedetti said. Competitors in the marketplace must define the combination of factors that give them competitive edges, he said.

Vendors must identify "what are the lost battles" in the industry, de Benedetti said, charging that producing mainframes is one of those lost battles. He believes European countries should put more effort into developing minicomputers and micros and concentrate on innovative technologies.

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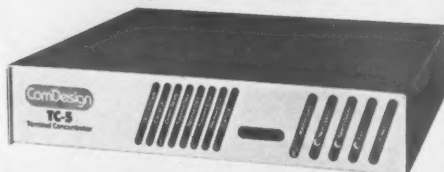
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Mergers & Acquisitions

American Sun Moon Star, Inc., manufacturer and importer of telecommunications equipment and systems and exclusive domestic representative of the Sun Moon Star Group of companies based in Taipei, Taiwan, has acquired JRB Systems of Palo Alto.

Liberty National Insurance Holding Co. has entered into an agreement to acquire CMI Corp. for \$20 million plus contingent payments based on CMI's future performance. CMI and its subsidiaries will continue to operate as separate corporations.

Pansophic Systems, Inc. has agreed in principle to acquire the Central Software product from Planning Research Corp. for \$1.5 million. Pansophic will market the product, which is designed to assist in the production of CICS applications, through its network of 30 offices and 16 international agents.

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Specialists Offer Insights Into Software Copyright

By Lois Paul
CW Staff

The question of who owns the rights to particular software (see story on Page 71) does not have a simple answer. However, some insights into the software ownership issue, particularly with regard to copyright, were outlined last week by several specialists in computer law.

"Copyright starts with the

author. Under the Copyright Act, copyright is automatic and exists from the moment when pen is lifted to paper" for anything written after Jan. 1, 1978, explained Daniel T. Brooks, director of the Washington, D.C. firm Computer Law Advisers and chairman of the Commission on Software in the '80s.

"In the case of a work made for hire, the employer or other persons for whom the

work was prepared is considered the author unless there is a written agreement to the contrary," he continued, noting there are two types of works made for hire.

Two Types of Work

The first is work by an employee within the scope of employment. This would not necessarily cover an instance in which a software developer who works for an organi-

zation that has a mainframe computer writes a program on a microcomputer in his home, Brooks said.

The second category of works made for hire is a commissioned work, which may be a subroutine for use with a larger program, a translation of a program from Cobol to Fortran or a supplementary work that is an enhancement to an existing application or documentation.

A copyright belongs to its author unless it has been transferred through a deed or an agreement, Brooks explained.

He described a situation in which a firm hires a consultant to write software. "If he is not doing a program that can be argued within one of these categories, so the employment or consulting agreement can define it as work for hire, he now has a copyright for what he does that has to be transferred by something like a deed to get it to the person he is working for."

Versions of a program after its initial coding or compilation are either copies or derivative works of the initially fixed version, depending on the extent of the new authorship, he added. Preparation of these copies or derivative works infringes the author's exclusive rights unless authorized.

"Ninety percent of the people in this world don't know that copyright is automatic and don't think about a problem," Brooks said. "There are already a lot of lawsuits — and that was before you had automatic copyright."

Joseph P. Zammit, a partner with the New York law firm of Reavis & McGrath, noted, "You have to be very careful of contractual arrangements ... Make sure you define things such as who owns what, who has the copyright and whether it is a joint copyright or one party retains the copyright with a license that lasts only as long as the contractual relationship lasts."

"All of those things can be mutually agreed upon. Otherwise, when they are not thought out in advance, you have problems down the road."

Zammit noted that because the Copyright Act stipulates that as soon as something is fixed in any tangible medium of expression it is copyrighted, "the filing is merely to get those procedural benefits."

New Companies

James Fischer Associates is a firm founded by a former senior vice-president and chief scientist for Warner Amex Cable Communications, Inc. that will offer consulting and services in financial, technical and business areas to operators and manufacturers in the cable and telecommunications industries. The firm's headquarters will be in Columbus, Ohio.



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Supershorts

Anacomp, Inc. has purchased the Continuous Integrated System retail banking software system for \$16 million from R.T.S. Associates, a limited partnership. The system has been under development by Anacomp for the partnership since 1979.

Decision Data Computer Corp. has acquired the field service business of International Micor Systems, Inc., a wholly owned subsidiary of Ramada Inns, Inc. International Micor pro-

vided maintenance for computerized hotel reservation and property management systems.

Maxcim is the new trade name for NCA Corp.'s DEC PDP-11- and VAX-11-based manufacturing/financial management system formerly known as MS-11/FS-11.

ITT Microsystems, Deerfield, Fla., has joined ITT Components Group, North America. ITT Components Group will provide technical, sales and marketing assistance for ITT Microsystems' line of thick-film hybrid microcircuits.

Vicom Systems, Inc. has been established as an independent, privately

held corporation. Previously a wholly owned subsidiary of Compression Labs, Inc. (CLI), Vicom Systems has issued stock in the new company to existing CLI shareholders as part of the separation agreement. Terms of the transaction were not disclosed.

Leading Edge Products, Inc. has formed two new divisions: Research and Development to provide technical support to manufacturers and Information Systems and Supplies to meet the needs of Nopa/Nomda dealers.

National Semiconductor Corp.'s suit against Linear Technology Corp. has been settled in what both parties described as a fair and proper resolu-

tion. Terms of the settlement were not announced. National Semi had filed suit in October 1981 charging Linear with raiding National Semi and threatening to utilize National Semi's trade secrets in the manufacture of linear integrated circuits.

Sord Computer Systems, Inc. of Tokyo has signed a letter of intent granting Business Computing International of New York, U.S. distribution rights for its microcomputer systems.

M/A-COM Linkabit has entered into negotiations with Digital Equipment Corp. for the joint marketing of Linkabit's IDX-3000 local communications network.

High Court Costs Force Settlement

(Continued from Page 71)

R. Hobson said. "If you understand the copyright laws fully, you really can't make a modification to software systems. So all of the 80 customers that we support were just shut down in the water for seven days.

"I feel I have been essentially exonerated," Hobson said of the settlement. "I am a little disappointed that the justice system requires you to have substantial money to prove your innocence. I thought it was innocence until proven guilty."

The two firms began working together in 1976, based on an agreement that apparently was mostly verbal to work with each other on an exclusive basis.

"In the fall of 1979, we signed an agreement with Data Decisions whereby they would act as a sales agent. The agreement assured them of the ability to have access to the source code if we were to go out of business or I got hit by a truck," Hobson said. His feeling is that Data Decisions interpreted the agreement as a relinquishment of all copyrights and rights to the software by ASD.

Relationship Crumbles

Hobson said the relationship began to crumble last fall when Data Decisions, began hiring away some of ASD's software staff.

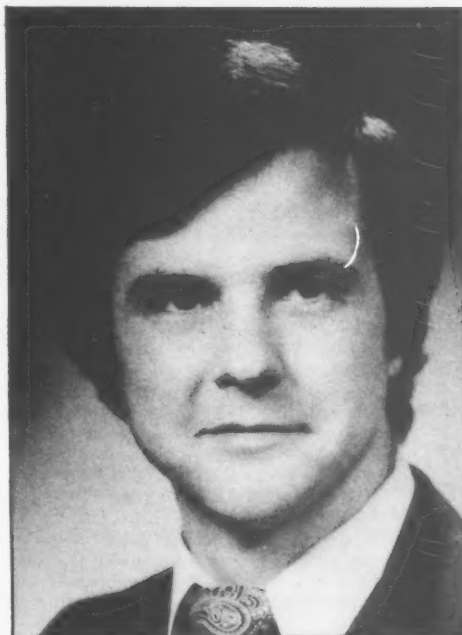
Subsequent problems, including a withholding of payments to ASD by Data Decisions, led the former firm to seek counsel to determine its rights in the matter. Hobson said he learned at that time that "as authors of the software, we would inherently hold the copyright to the material created unless we had specifically signed that right away."

Despite this knowledge, Hobson recognized that the copyright dispute could have been resolved either way. Because of this, his firm did not use the software in question for any other purposes other than to support its current customers.

In February, ASD also acquired a franchise for Western Business Computers, which has developed a compiler designed to enable the Honeywell, Inc. DPS 6 minicomputer to use Qantel source code. Hobson said part of the suit involved the assumption that his firm had used the source code created during its association with Data Decisions on the Honeywell system.

"In point of fact, our Honeywell only came in last week, and we couldn't have done it even if we had wanted to," he said.

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CW 7582

Academic Ills Seen Threatening Route 128 Belt

(Continued from Page 71)

In Massachusetts the financial woes of public high schools and colleges are a by-product of controversial Proposition 2½, the 1980 property tax reduction bill, that was supported by many high-technology executives, but forced large cutbacks in school fundings. "A shortage of staff and equipment exists in all programs — high school mathematics and science, high-technology vocational courses, two-year post-secondary technical curricula and engineering and computer science education," the survey found.

Useem correlated Boston-area education trends with the computer industry's demand for a skilled labor force in a 75-page study entitled

"Education in a High Technology World: The Case of Route 128." After some 130 interviews with educators, industry representatives and government officials, along with survey responses from 158 teachers, Useem determined that while "students' interest at all educational levels in Massachusetts is moving in a direction congruent with industry needs ... the capacity of educational institutions to respond to that demand remains in doubt."

Thus, while enrollment in the maths and sciences is increasing in the seven school districts covered by the study, budgetary considerations have precipitated a decrease in new equipment purchases or replacements, fewer course offerings, staff

layoffs and an overall disgruntled teaching community, Useem's study found.

Approximately 60% of the teachers she surveyed said that they were "seriously considering a career change" because of "declining job satisfaction and inadequate salary compensation." Many plan to seek jobs with high-technology firms where they can use their math and science skills and, in several cases, double their salaries.

In summary, Useem reported that "at a point when industry stands at the threshold of a new microelectronics era, schools look back to an earlier time as their golden age."

But while preparation at public high schools for high-tech careers is

weakening, programs at community colleges and two-year post-secondary schools are pushing toward expansion. Here, relations with the technology belt industries are not quite so strained, with "pockets of constructive training relationships," and three industry executives serving on the Massachusetts Board of Regents of Higher Education.

Useem last year completed a similar study on Silicon Valley.

Midwest Best Bet For Firms: Study

(Continued from Page 71)

panies of labor cost, tax environment, transportation, market access, energy costs, climate and cultural amenities. When these are all taken into consideration, they explain why the Midwest — Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin — will lead the other regions in the percentage increase in new plant additions over the next five years, the JEC study said.

The Southeast, Southwest and Mountain and Plains states are also expected to increase their relative share of high-technology companies over this period, the study added.

New England and the Far West are not expected to keep pace in the growth of high-technology companies, according to the JEC. "Apparently, the high cost and availability of labor, high taxes, congestion and the inadequate room for expansion" in those areas "are beginning to outweigh their advantages."

Workers, Schools Draw DP Firms

(Continued from Page 71)

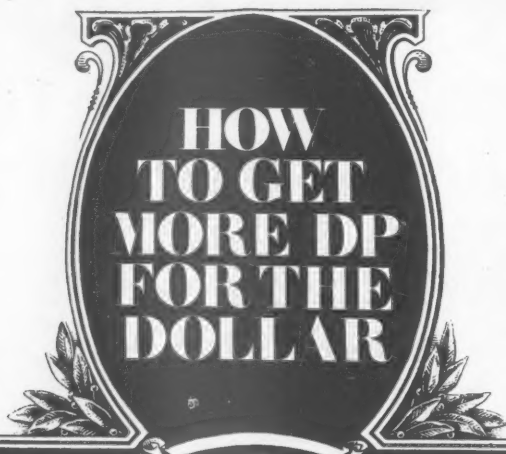
the recreational and intellectual opportunities of a region," the study added.

This helps to explain the booming high-tech environments of such disparate areas as the Route 128 region of Boston, Silicon Valley in California and North Carolina's Research Triangle. Elaborating on the work force considerations for high-technology industries, the report said most firms rate access to technical workers above access to professional or skilled workers.

Explaining this fact by noting the "difference in mobility rates of machinists, welders and computer programmers on the one hand and engineers and scientists on the other," the JEC study said, noting the latter are more highly mobile.

"High-technology companies may perceive that a regional [professional and skilled] shortage that may exist can be overcome by offering the appropriate financial inducements, whereas technical workers may be more difficult to entice to a region," the study said.

The JEC study was based on 700 questionnaire returns from American Electronic Association members and assorted Boston-area high-tech firms and was called "Location of High Technology Firms and Regional Economic Development."



How to do more with less in DP/MIS departments

At the same time that top management is expecting more and more from its MIS/DP department, that same management is being pressured to cut back on costs. This means that DP/MIS managers are being given two seemingly conflicting tasks: Use MIS assets to increase the company's competitive edge and keep market share and revenues up and, at the same time, cut back on MIS costs to insure profitability.

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Dr. Harold Kinne, President & Founder, Halkin Computing Corp.

"The Future of Information Appliances"

Jean Yates, Gnostic Concepts

"Micro Operating Systems"

John Dvorak, Editor, *InfoWorld*

"New and Future Products"

Maggie Canon, Editor-in-Chief, *InfoWorld*,

Panel: "Personal Computers in the Office"

Howard Anderson, President, The Yankee Group

"The IBM Personal Computers: The Effects on the Industry"

Tuesday, DP Role in Office Automation

Amy Wohl, President, Advanced Office Concepts Corp.

"Achieving the Possible"

Patty Seybold, Editor, The Seybold Report

Dr. John McQuillan, President, BBN Information

Management and Dr. Michael Zisman, President,

Integrated Technologies Inc.

"OA Survivors Guide to Multivendor Environments"

Evelyn Wilk, Consultant, Arthur Andersen & Co.

"Management and Professional Work Stations"

Alexandra Corson, Program Director, IDC.

Panel: "IBM Software Strategy"

Dr. Warren Briggs, Suffolk University

"Distributed Decision Support Systems"

Wednesday, In-Depth Communication Seminars

Dr. Dixon Doll, President, DMW Group

"PBX Role in Office Automation" & "Teleconferencing"

Thomas A. Hannagan, President, Hannagan & Associates

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Dr. Michael Hammer, Associate Professor, MIT

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with a minimum of 3 years' COBOL programming experience on a medium size machine, including exposure to both system design and computer operations. The ability to demonstrate familiarity with user, data control and operating documentation is essential. Preference will be given to applicants with DEC10/DEC20 experience. Ref. AIF.1122.

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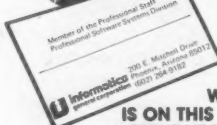
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Job Qualifications: An advanced degree is preferred, since the successful candidate must be accepted as a colleague by the University at-large. Therefore, a record of achievement as demonstrated by academic attainment and work experience is vital. The applicant's work experience should also include administrative skills. A thorough knowledge of hardware and software computer technology is required. In addition, the candidate should have an understanding of computer usage in a teaching and research environment.

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Manage the development and installation of information systems for planning, control and operations of all TEGAL data processing services and equipment.

Reporting directly to the President, you will be responsible for all systems analysis, programming and computer operations, preparing long-range systems projects/plans with priority recommendations. You will also act as consultant to users in all functional areas. Selected candidate will be involved in systems design and development providing analysis of necessary information needs to enhance system efficiency and eliminate duplication of programming efforts. Preparation and administration of project and department budgets is an essential function of this position.

Candidates will have a BSCS (or equivalent) and at least 5-7 years systems design, planning and installation experience in data processing to include prior management experience. Familiarity with IBM System 34/38, MAPICS and RPG II desired; manufacturing experience preferred.

Tegal offers excellent career opportunities in line with our dramatic growth projections; full benefits and salary commensurate with experience. For more information, send your resume or phone Recruiting Manager, Technical Recruitment, TEGAL, 11 Digital Drive, Novato, CA 94947. (415) 472-7500. We are an equal opportunity employer. Individuals only apply.

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CW-A3284

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HINDUSTAN COMPUTERS LIMITED has in the past six years continuously broken new grounds in the Indian market-place with its products, and has emerged as the largest manufacturer of computers in India. Our current mini-computer offering in throughput has already nudged the low-end mainframes, and as a planned philosophy we have now finalised our product plans and scope to address the needs of mainframe users.

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This division is now looking for special people who can build, organise and consolidate through impeccable planning and stringent implementation. They should, therefore, necessarily possess a spectrum of skills to capably address in-company and customer needs for products ranging from mini-computers to mainframes. They should have at least 7 years of experience in managing people and 12 years of experience in the Data Processing Industry, preferably with large Indian/International Computer Manufacturers or leading User Organisations; having planned and ensured successful execution of these plans within prescribed time-frame and other parameters, and exposure to intra-functional dialogue and decision making.

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With time, HCL has become a premier high-technology organisation almost doubling its turnover yearly. For people who can match our ambitions and can grow with and contribute to achieving our plans, remuneration will not be a limiting factor.

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The successful applicant will have an MSCS and at least 3 years microprocessor software applications experience or equivalent. A background in either UNIX, CP/M or major microprocessor operating systems, and programming experience in Assembler, ADA, PASCAL, "C" or BASIC, is highly desirable.

Our corporate environment is noted for: recognizing and rewarding personal contributions, competitive salaries commensurate with experience, and excellent benefits. Merit promotions based on performance, coupled with extensive in-house technical and professional training provide opportunities for upward mobility and significant career growth.

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You will direct a team of programmer analysts to work on both batch and on-line applications.

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BS/CS or Accounting required with a minimum of 6 years in developing large scale on-line, data base finance/accounting systems. Must have expertise in system-level analysis and design, strong project leader skills, knowledge in data base and on-line concepts, and experience with high level languages such as FOCUS, IDMS and ADS/On-Line.

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BS/CS or Accounting required with a minimum of 3 years in a large scale business software development environment. Working knowledge of on-line data base finance/accounting systems, experience in all phases of a systems development life cycle, knowledge of structured design and coding concepts as well as technical expertise in ANS COBOL, MVS JCL, IDMS and IDMS/DC mandatory.

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PROGRAMMER-Design, implement, code & test computer systems, and conversion from manual systems. Responsible for systems testing & enhancement of existing programs. Provide support for live systems. B.Sc. or equivalent in Computer Science, Data Processing, Maths., or Physics. Must have knowledge of COBOL, ASSEMBLER, & CICS. 2 yrs or 2 yrs in programming, \$27,000 p.a. to work 40 hrs/5 days/wk. Please send resumes to: Applied Data Research, Inc. Route 205 & Orchard Road CN-8, Princeton NJ, 08540

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Blue Cross/Blue Shield of Florida, Inc. is the largest and most experienced provider of health care protection in the state of Florida. Our continued success depends on our ability to find competent data processing professionals willing to share our strong commitment to innovation and excellence.

We are currently seeking experienced applications Programmer and Systems Analysts to provide additional systems and programming expertise to our growing Systems Division. The ideal candidate will have the following qualifications:

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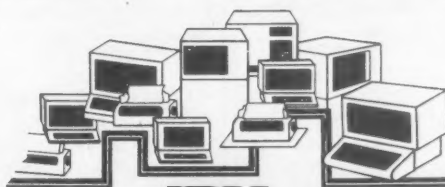
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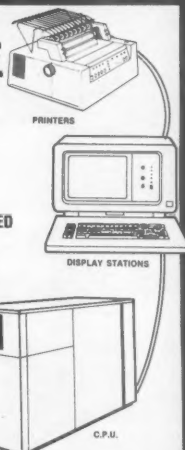
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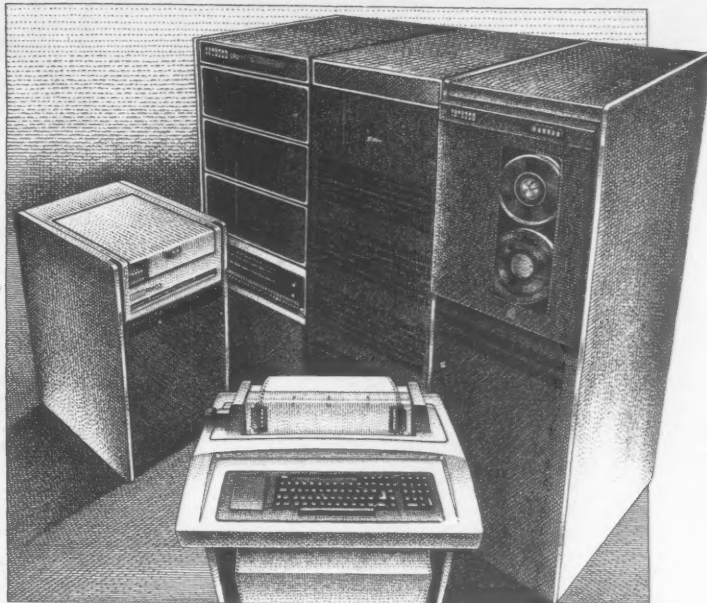
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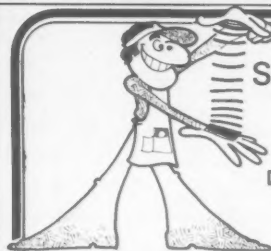
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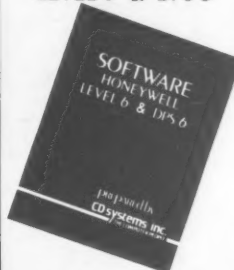
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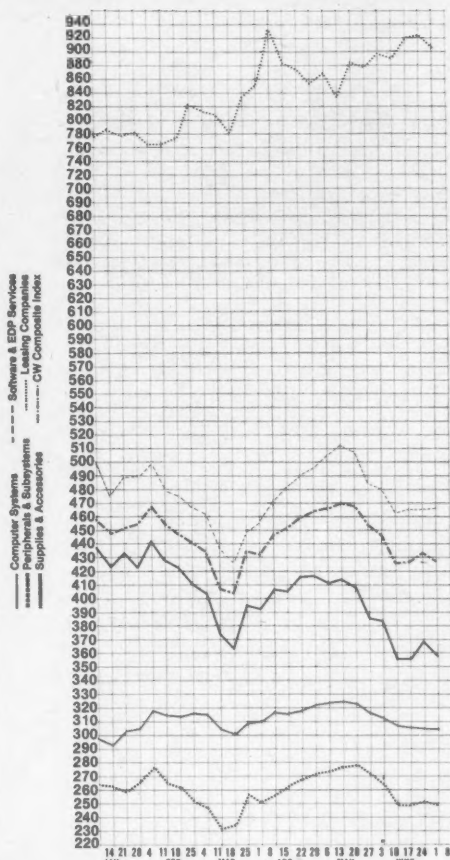
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|--|------------------------|---------|--------|--------|-------|------|-----|------------------------|----------------------|-------|--------|--------|-------|-----|-----|---------|----------------------|-------|--------|--------|-------|-------|---------|---|-------|-------|--------|------|-------|-----|-----|--|--|--|--|--|--|--|--|
| | | 1981-82 | | CLOSE | WEEK | WEEK | | | 1981-82 | | CLOSE | WEEK | WEEK | | | 1981-82 | | CLOSE | WEEK | WEEK | | | 1981-82 | | CLOSE | WEEK | WEEK | | | | | | | | | | | | |
| X | C | RANGE | JUN 30 | 1982 | CHNGE | NET | PCT | X | C | RANGE | JUN 30 | 1982 | CHNGE | NET | PCT | X | C | RANGE | JUN 30 | 1982 | CHNGE | NET | PCT | X | C | RANGE | JUN 30 | 1982 | CHNGE | NET | PCT | | | | | | | | |
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| A | AMDAHL CORP | 18-46 | 19 3/4 | -1 1/2 | -2.5 | | | D | ADVANCED COMP TECH | 1-6 | 1 1/2 | 0 | 0.0 | | | A | COMPUTER CONSOLES | 16-28 | 20 1/4 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | BURROUGHS CORP | 28-72 | 31 1/2 | -2 1/2 | -7.3 | | | O | ADVANCED SYSTEMS INC | 10-15 | 11 1/4 | +1/4 | +2.2 | | | O | COMPUTER DEVICES INC | 4-10 | 7 7/8 | +5/8 | +8.6 | | | | | | | | | | | | | | | | | | |
| O | COMPUTER AUTOMATION | 8-28 | 9 | +1 1/4 | +16.1 | | | O | ANACORP INC | 10-19 | 12 7/8 | +1 | +8.4 | | | O | COMPUTER TRANSCIVER | 3-9 | 4 | +1/4 | +5.8 | | | | | | | | | | | | | | | | | | |
| N | CONTROL DATA CORP | 18-42 | 24 3/8 | -3/8 | -1.5 | | | N | ANALYSTS INTL CORP | 3-14 | 8 | 0 | 0.0 | | | N | COMPUTERIZATION CORP | 20-48 | 24 | -1/2 | -3.9 | | | | | | | | | | | | | | | | | | |
| N | CRAY RESEARCH INC | 20-48 | 24 | -3/4 | -3.0 | | | A | APPLIED DATA RES. | 13-25 | 20 | +1/2 | +2.5 | | | N | COMRAC CORP | 17-28 | 24 1/2 | -1 | -3.9 | | | | | | | | | | | | | | | | | | |
| N | DATA GENERAL CORP | 25-67 | 25 5/8 | -1 7/8 | -6.8 | | | O | ASK COMPUTER SYSTEMS | 11-17 | 16 3/8 | +1 1/2 | +10.0 | | | A | DATA ACCESS SYSTEMS | 2-13 | 1 5/8 | -1 1/8 | -40.8 | | | | | | | | | | | | | | | | | | |
| N | DATAPoint CORP | 11-88 | 12 1/8 | -1/4 | -2.0 | | | N | ASTRADYNE COMP IND | 1-3 | 1 3/8 | 0 | 0.0 | | | N | DELTA DATA CORP INC | 4-13 | 17 1/4 | +1/4 | -1.4 | | | | | | | | | | | | | | | | | | |
| N | DIGITAL EQUIPMENT | 68-113 | 68 7/8 | -1 3/8 | -1.9 | | | N | AUTOMATIC DATA PROC | 22-32 | 24 5/8 | -3/8 | -1.5 | | | O | DATARAM CORP | 4-15 | 6 7/8 | -1/4 | -3.3 | | | | | | | | | | | | | | | | | | |
| A | ECCO INC | 5-18 | 8 5/8 | -3/8 | -4.1 | | | O | CIA COMPUTER ASSOC | 4-25 | 6 3/4 | -1/2 | -6.8 | | | O | DATUM INC | 2-5 | 2 1/8 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | ELECTRONIC ASSOC. | 5-13 | 6 3/4 | -7/8 | -11.4 | | | O | COMPUTER ASSOC INT'L | 12-20 | 17 3/4 | +1/4 | +1.4 | | | O | DAVID JAMISON CARLVL | 3-7 | 3 1/4 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | FLOATING POINT SYST | 13-30 | 20 1/4 | -1 1/8 | -5.2 | | | O | COMPUTER HORIZONS | 1-5 | 2 | -1/4 | -11.1 | | | O | DECISION DATA CORP | 0-2 | 1 1/8 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | FILIBORO | 25-82 | 24 3/4 | -3 3/4 | -13.1 | | | O | COMPUTER NETWORK | 6-9 | 8 1/2 | +1/8 | +1.0 | | | O | DELTA DATA SYSTEMS | 2-4 | 1 5/8 | -1/4 | -13.3 | | | | | | | | | | | | | | | | | | |
| O | FULCRUM CORP GRP | 1-3 | 1 1/4 | 0 | 0.0 | | | O | COMPUTER SCIENCES | 11-30 | 12 1/4 | +1/8 | +1.0 | | | N | ELECTRONIC M & M | 3-9 | 4 | +1/4 | +6.6 | | | | | | | | | | | | | | | | | | |
| O | GENERAL AUTOMATION | 3-16 | 3 7/8 | -1/8 | -3.1 | | | O | COMPUTER TASK GROUP | 10-23 | 10 3/4 | +1/4 | +2.3 | | | O | EVANS & SUTHERLAND | 18-40 | 28 1/4 | +1 1/2 | +8.3 | | | | | | | | | | | | | | | | | | |
| N | HARRIS CORP | 21-60 | 24 5/8 | +7/8 | +3.6 | | | O | COMPUTER USAID | 2-10 | 2 3/8 | +1/8 | +5.5 | | | N | GEN'L DATA CORP INC | 7-18 | 9 3/8 | +1/8 | +1.4 | | | | | | | | | | | | | | | | | | |
| N | HEWLETT-PACKARD CO | 33-54 | 42 1/2 | -5/8 | -1.4 | | | O | CONSERV CORP | 8-16 | 12 1/2 | -1 1/4 | -9.0 | | | O | GENERAL TERMINAL CP | 0-4 | 3/8 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | HONEYWELL INC | 69-113 | 67 | -1 | -1.4 | | | O | CORSHARE | 6-21 | 5 3/4 | +1/8 | +2.2 | | | O | GREAT SOUTHWEST INC | 1-12 | 4 3/4 | -1/4 | -5.0 | | | | | | | | | | | | | | | | | | |
| N | IBM | 48-73 | 60 5/8 | -1/2 | -0.8 | | | N | CULLINANE DATABASE | 15-37 | 29 7/8 | +3/4 | +2.5 | | | N | HAEFL TIME CORP | 18-33 | 24 3/4 | -1/8 | -0.5 | | | | | | | | | | | | | | | | | | |
| O | IPL SYSTEMS INC | 6-13 | 5 3/4 | +1/4 | +4.5 | | | O | DATA DIMENSIONS INC | 0-4 | 1/4 | 0 | 0.0 | | | O | INFORMATION INTL INC | 8-17 | 10 3/4 | -1/4 | -2.2 | | | | | | | | | | | | | | | | | | |
| O | INSTRON CORP SYST | 3-32 | 3 3/8 | 0 | 0.0 | | | O | DATASIS | 1-4 | 3/4 | -1/4 | -7.7 | | | O | INTEL CORP | 21-51 | 31 1/4 | -1/4 | -0.7 | | | | | | | | | | | | | | | | | | |
| N | MANAGEMENT ASSIST | 8-28 | 10 3/8 | -7/8 | -7.7 | | | O | DVATRON CORP | 2-11 | 2 3/8 | -1/8 | -5.0 | | | O | INPL SYSTEMS INC | 5-15 | 5 3/4 | +1/4 | +4.5 | | | | | | | | | | | | | | | | | | |
| O | MINI-COMPUTER SYST | 0-4 | 3/8 | +1/8 | +25.0 | | | N | ELECTRONIC DATA SYST | 15-30 | 27 | +1 1/8 | +4.3 | | | A | LUNDY ELECTRONICS | 7-18 | 10 | +3/8 | +3.8 | | | | | | | | | | | | | | | | | | |
| N | MODULAR COMPUTER SYS | 7-32 | 8 | +1/8 | +1.5 | | | O | INFORMATICS INC | 10-23 | 12 1/2 | -1/4 | -3.4 | | | A | MSI DATA CORP | 11-27 | 15 5/8 | -3/8 | -2.8 | | | | | | | | | | | | | | | | | | |
| N | NONAMK DATA SCI | 10-32 | 11 1/2 | +1/8 | +1.0 | | | O | INSYTE CORP | 1-3 | 3 1/8 | +1/4 | +8.6 | | | O | NETWORK SYSTEMS CORP | 14-25 | 18 3/8 | -5/8 | -3.2 | | | | | | | | | | | | | | | | | | |
| N | OLR | 38-76 | 52 5/8 | -2 3/4 | -4.8 | | | O | JPS COMPUTER MARKET | 1-4 | 1 1/4 | 0 | 0.0 | | | O | ONEX | 3-8 | 3 1/2 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| N | PARMINT-ELMER | 18-38 | 17 3/4 | -1 1/4 | -8.5 | | | O | KEANE ASSOCIATES | 4-8 | 4 1/4 | 0 | 0.0 | | | N | PARADYNE CORP | 23-32 | 27 7/8 | -2 3/4 | -8.8 | | | | | | | | | | | | | | | | | | |
| N | PERMIL COMPUTER INC | 17-46 | 18 5/8 | -1 7/8 | -8.1 | | | O | LOGICON | 12-38 | 14 3/4 | +1 1/8 | +8.2 | | | A | PENRIL CORP | 7-17 | 9 1/2 | +2 | +26.6 | | | | | | | | | | | | | | | | | | |
| N | SPERRY CORP | 22-65 | 22 1/2 | -5/8 | -2.7 | | | O | MGIT SCI APPR INC | 17-26 | 22 1/4 | +1/4 | +1.1 | | | O | PARTER CORP | 17-19 | 17 1/2 | +1/4 | +1.4 | | | | | | | | | | | | | | | | | | |
| N | TANDEN COMPUTERS INC | 13-35 | 23 | -1/4 | -1.0 | | | O | MATHEMATICA INC | 12-28 | 14 | +3/4 | +5.6 | | | O | RECOGNITION EQUIP | 4-21 | 4 1/4 | -1/8 | -2.8 | | | | | | | | | | | | | | | | | | |
| N | TEXAS INSTRUMENTS | 71-151 | 88 5/8 | -1 | -1.1 | | | O | MATHEMATICAL APP GRP | 14-28 | 18 | 0 | 0.0 | | | O | SCAN DATA | 1-3 | 1 1/4 | -1/4 | -16.6 | | | | | | | | | | | | | | | | | | |
| A | WARD LABS. | 22-46 | 23 3/4 | +1 | +4.3 | | | O | NATIONAL DATA CORP | 14-28 | 15 3/4 | -1 1/4 | -7.3 | | | N | STORAGE TECHNOLOGY | 18-40 | 21 | -2 1/4 | -9.6 | | | | | | | | | | | | | | | | | | |
| LEASING COMPANIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| O | ANOTHE FINANCIAL CP | 18-28 | 22 1/2 | 0 | 0.0 | | | O | PANOPHIC SYSTEMS | 8-15 | 10 1/2 | 0 | 0.0 | | | O | STYDES DATAONICS | 8-33 | 11 | -3/4 | -6.8 | | | | | | | | | | | | | | | | | | |
| N | COMDISCO INC | 16-27 | 18 1/4 | +1 | +5.7 | | | O | PLANNING RESEARCH | 5-13 | 6 1/2 | 0 | 0.0 | | | A | T BAR INC | 8-18 | 8 1/4 | +3/4 | +8.3 | | | | | | | | | | | | | | | | | | |
| P | COMMERCIAL GROUP CORP | 1-2 | 5/8 | 0 | 0.0 | | | O | PROGRAMMING & SYS | 1-2 | 1 3/8 | 0 | 0.0 | | | A | TEC INC | 4-11 | 9 5/8 | +5/8 | +6.9 | | | | | | | | | | | | | | | | | | |
| O | COMPUTER INVESTORS GRP | 1-4 | 3/8 | 0 | 0.0 | | | O | REYNOLDS & REYNOLD | 16-26 | 20 | +1/2 | +2.5 | | | N | TEKTRONIX INC | 4-17 | 52 1/4 | -1/4 | -0.4 | | | | | | | | | | | | | | | | | | |
| O | CONTINENTAL INFO SYS | 4-8 | 7 3/4 | -1/4 | -3.1 | | | O | SHARED MEDICAL SYST | 26-37 | 29 | +1/4 | +0.8 | | | N | TELEX | 5-10 | 8 | -1/8 | -1.5 | | | | | | | | | | | | | | | | | | |
| N | DPE INC | 3-13 | 8 5/8 | 0 | 0.0 | | | O | STSC INC | 6-28 | 10 | +1/8 | +1.2 | | | O | TESDATA SYSTEMS CP | 3-17 | 3 1/2 | +1/2 | +16.6 | | | | | | | | | | | | | | | | | | |
| O | ITEL | 1-15 | 5/8 | -1/8 | -16.6 | | | O | SCIENTIFIC COMPUTERS | 6-16 | 7 1/4 | -1/4 | -3.3 | | | O | TIMEPLEX INC | 7-18 | 9 5/8 | -1/4 | -2.5 | | | | | | | | | | | | | | | | | | |
| N | LEASPCORP | 1-2 | 1/8 | 0 | 0.0 | | | O | SOFTWARE AG | 8-23 | 5 5/8 | +1/8 | +2.2 | | | O | VISUAL TECHNOLOGY | 10-15 | 11 1/4 | +3/4 | +7.1 | | | | | | | | | | | | | | | | | | |
| N | U.S. LEASING | 18-30 | 21 3/4 | +1/4 | +1.1 | | | N | TYNSHARE INC | 14-58 | 14 1/4 | -2 3/8 | -14.2 | | | O | WILTEK INC | 1-3 | 1 1/8 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| PERIPHERALS & SUBSYSTEMS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | AM INTERNATIONAL | 1-15 | 1 1/4 | 0 | 0.0 | | | A | URS CORP | 11-18 | 11 5/8 | -1/4 | -2.1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | ANDERSON JACOBSON | 9-26 | 9 5/8 | +5/8 | +6.9 | | | N | WVLY CORP | 7-20 | 8 7/8 | +1/2 | +5.9 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| O | AUTO-TROL TECHNOLOGY | 8-32 | 12 1/4 | -1/8 | -1.0 | | | SUPPLIES & ACCESSORIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| O | BANCTEC INC | 7-35 | 7 1/2 | -1 1/2 | -16.6 | | | N | AMERICAN BUS PRODS | 11-17 | 12 1/4 | -5/8 | -4.8 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| O | BECHTEL INT'L | 8-18 | 8 1/2 | -1/8 | -1.8 | | | N | BALTIMORE BUS FORMS | 0-2 | 1 1/4 | 0 | 0.0 | | | N | BARRY WRIGHT | 14-24 | 15 | +1 1/8 | +8.1 | | | | | | | | | | | | | | | | | | |
| O | BOLT-BERANEK & NEW | 25-35 | 24 3/4 | +3/4 | +2.4 | | | O | CYBERMATICS INC | 1-2 | 1 | 0 | 0.0 | | | O | DUPLEX PRODUCTS INC | 12-17 | 14 | -1/4 | -1.7 | | | | | | | | | | | | | | | | | | |
| O | CAMEX CORP | 2-8 | 2 1/2 | 0 | 0.0 | | | O | ENRIS BUS FORMS | 15-23 | 20 | +3/4 | +3.8 | | | N | 3M COMPANY | 48-65 | 53 1/4 | -1/4 | -0.4 | | | | | | | | | | | | | | | | | | |
| N | CENTRONICS DATA CORP | 7-40 | 10 1/2 | +1/8 | +1.2 | | | O | MOORE CORP LTD | 26-38 | 27 1/8 | -3/4 | -1.4 | | | O | MOORE CORP LTD | 26-38 | 27 1/8 | -3/4 | -1.4 | | | | | | | | | | | | | | | | | | |
| A | CETEC CORP | 4-8 | 4 | 0 | 0.0 | | | O | NADIA CORP | 12-33 | 12 3/8 | -3/4 | -12.9 | | | N | NADIA CORP | 12-33 | 12 3/8 | -3/4 | -12.9 | | | | | | | | | | | | | | | | | | |
| O | COGNITRONICS | 2-11 | 3 1/2 | +1/2 | +16.6 | | | O | STANDARD REGISTER | 30-43 | 39 1/4 | 0 | 0.0 | | | O | STANDARD REGISTER | 30-43 | 39 1/4 | 0 | 0.0 | | | | | | | | | | | | | | | | | | |
| O | COMPUTER COMMUN. | 1-2 | 1 1/2 | 0 | 0.0 | | | O | TAB PRODUCTS CO | 14-30 | 14 3/8 | +1/4 | +1.7 | | | N | WILLACE BUS FORMS | 22-38 | 30 1/8 | -1/4 | -0.8 | | | | | | | | | | | | | | | | | | |
| TICKER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N=NEW YORK; A=AMSTERDAM; P=PHILADELPHIA; B=BOSTON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I=INDIANAPOLIS; M=MINNEAPOLIS; Q=QUEBEC; THE-COUNTY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10-11 TO NEAREST DOLLAR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
 R=REGIONAL; R=WEST; O=OVER-THE-COUNTER
 O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
 (1) TO NEAREST DOLLAR

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